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Original Articles.

THE PREVENTION OF SCURVY IN THE NAVY

By Surgeon Commander I. L. PRISTON, M.B., M.R.C.P., D.P.H., R.N.

In an interesting historical investigation Smith (1919) showed that scurvy was very common in the Navy before 1797, but that after that date the incidence decreased. The improvement was partly due to the introduction of preserved lemon juice as an antiscorbutic. This juice was originally made from lemons (*Citrus medica* var. *limonum*) obtained from Sicily and when it was carefully prepared was effective in preventing scurvy. Supplies obtained from contractors were, however, often of poor quality and frequently failed to prevent scurvy. This was due sometimes to the dishonesty of contractors and in other cases to faulty methods of preservation which destroyed all the vitamin C whilst preserving the citric acid to which the antiscorbutic action of the juice was at that time attributed. In consequence of the difficulty experienced in obtaining good supplies from the Mediterranean the Admiralty shortly after 1860, began to get supplies from the West Indies of a juice prepared from the sour lime (*Citrus medica* var. *acida*) a fruit which, even when fresh, has been shown by Chick, Hume and Skelton (1918) to have only about one quarter of the potency of fresh lemons. The lime juice obtained from the West Indies was thought to have the same antiscorbutic powers as the lemon juice obtained from the Mediterranean, and the name "lime juice" was applied indiscriminately to both. This lime juice was supplied to the *Alert* and *Discovery* for Sir George Nares' expedition to the Arctic in 1875 when scurvy prevailed to such an extent as to ruin the expedition.

On the return of Nares' expedition to England a committee was appointed to inquire into the reason of the outbreak of scurvy, but this committee failed to observe either the difference in the source of the anti-

A

[illegible] the West Indies [illegible] continued to be supplied to the Navy [illegible] antiscorbutic, although from time to time [illegible] fact that it had no antiscorbutic [illegible] (1920). Chick, Hume and [illegible] (1918) [illegible] supplied to the Navy and Army [illegible] and this observation was confirmed [illegible] and Stevenson (1926) [illegible].

It was [illegible] would prove more [illegible] the Admiralty [illegible] prepared by the [illegible] The [illegible] was supplied to [illegible] in 1918 and 1919 [illegible] rapidly and was [illegible] power than the [illegible].

[illegible] antiscorbutic [illegible] of oranges, lemons, [illegible] specially prepared [illegible] were found [illegible] and by Chick, Hume and [illegible] (1918) [illegible] that of fresh lime [illegible] samples prepared on a [illegible] the Navy [illegible] contained little or no [illegible] the method of preparation [illegible] West Indies by lengthy sedimentation [illegible] sulphites. It is [illegible] addition of rum as [illegible] such prolonged treatment [illegible] properties.

[illegible] in the same way when [illegible] Smith (1921) [illegible] specially prepared by [illegible] methods as [illegible] Davey (1921) [illegible] gave no protection [illegible]. Several other samples of [illegible] preserved lemon [illegible] examined for official [illegible] have been found to [illegible] properties. Ordinary [illegible] deliveries of lemon [illegible] were always unsatisfactory. [illegible] supplied to [illegible] polar expeditions in 1819 [illegible] (1817-1818) [illegible] nor did they keep well. [illegible] type of preserved [illegible] consistently prevented scurvy [illegible] preserva[illegible] specially prepared for the [illegible] sent in search of [illegible] Franklin between 1850 and 1854. [illegible] juice was squeezed [illegible] lemons at Deptford Victualling Yard and was immediately [illegible] either by addition of rum or by boiling [illegible] minutes under the [illegible] supervision of the officers there. It prevented scurvy almost

[illegible]
similar commercial methods is no better.

In view of these facts the Admiralty [illegible] lemon juice in 1921 and at the present time lime juice [illegible] as before not as an antiscorbutic but as a safe drink for the [illegible] hot climates. It was decided to rely for the time being on a plentiful supply of fresh fruit and vegetables to prevent scurvy, observing that scurvy has become a rare disease in the Navy probably because of the ease with which fresh food can be obtained now when voyages are shorter than they used to be in the days of sailing ships.

During the recent war when ships remained at sea and fresh food was sometimes difficult to obtain many cases of scurvy might have been expected to occur but only three definite cases of scurvy were recorded in the total force of the Navy between August 1 1914 and December 31, 1918[1] and one of these, described by Rolleston (1916) was self induced by a patient who obstinately refused to eat fresh fruit or vegetables, although they were provided. Three mild and indefinite cases which may have been connected with vitamin C lack were also described by Gittings (1919). Edgar (1917) described one doubtful mild case in an officer of a motor launch.

On the other hand cases of beri beri have frequently occurred in warships serving in the Persian Gulf where it is difficult to get fresh fruit and vegetables. A form of beri beri which occurs in ships known as ship beri-beri has been shown by Darling (1914) to be intermediate between beri beri and scurvy and it appears likely that it is the result of deficiency of both vitamins B and C in the diet. It seems probable that relative deficiency of vitamin C in the diet may play a part in the causation of the type of beri beri which occurs in warships in the Persian Gulf. In 1909 and 1910 there was a severe outbreak of this disease coinciding with a period of blockading the Persian coast which kept the ships a long time at sea. Munday (1910) records the improvement which followed better arrangements for supplying fresh fruit vegetables and meat, but cases continued to occur sporadically until the outbreak of the war showing the difficulty of procuring fresh food under active service conditions in the tropics.

During the war over 200 cases of beri beri were recorded in the Navy mainly amongst ratings who had been serving in the Persian Gulf. It was generally agreed that lack of fresh vegetables was a predisposing factor, and it seems likely that deficiency of vitamin C in the diet was partly responsible in some cases (Bassett Smith, 1924. Hamilton, 1919).

Cramer (1922) (1924) (1925) has emphasized the view that under

[1] Editorial Journal of the Royal Naval Medical Service, 1919 v, 329

[illegible] effect upon [illegible] health [illegible] sufficient to [illegible] definite dis[illegible] [illegible] and [illegible] ha[illegible] been recorded by N[illegible] (18[illegible]) [illegible] Steven[illegible] (1[illegible]) and M[illegible] [illegible] scorb[illegible] [illegible] W[illegible] and [illegible] have shown that [illegible] low in vitamins [illegible] more susceptible to inf[illegible] [illegible]. It seems p[illegible]ble that such a low [illegible] amongst naval ratings in the trop[illegible] but the connection between this state and [illegible] observed.

S[illegible] cases of scurvy amongst workmen [illegible] from Murmansk to Archangel in 19[illegible] fortunately a good supply of fresh [illegible]. Had [illegible] not been procurable there would [illegible] that the [illegible] except Navy lime [illegible].

[illegible] to provide any special [illegible] the supply of fresh vegetables [illegible] sufficient to keep the men [illegible] above where such a [illegible] have [illegible]. Should it [illegible] be necessary to maintain [illegible] et in trop[illegible] conditions a large [illegible] ill health and [illegible] anticipated unless a [illegible] of emergency. Such [illegible] fresh vegetables [illegible] vegetables could be [illegible] to be eaten [illegible] and enteric fevers [illegible] galley usually entails [illegible] vegetables [illegible] proportion of their [illegible].

[illegible] tropical waters would [illegible] tood through hot [illegible] the reduction of bulky [illegible] vegetable foods as could [illegible]. In such a case a [illegible] be preserved against an [illegible] to the health [illegible] to consider what [illegible].

[illegible] available in warships [illegible] peas and haricot beans. [illegible] (1912) [illegible] vitamin which is [illegible] pulses and cereals, makes its app[illegible] (1917), and [illegible] nation [illegible] and that 3 [illegible] to [illegible] gram [illegible] by Stevenson (1920) in the [illegible] germinated dhall was [illegible] and to treat scurvy (Willcox [illegible]) by Wiltshire (1918) in Serbia [illegible] results.

Germinated rice and pulses form an ordinary part of the diet of some Chinese and are eaten in the Malay States and Dutch Indies but there are some difficulties connected with the use of germinated pulses in the Navy although there is no doubt of their antiscorbutic efficiency. Firstly the process takes two or three days to carry out and about [illegible] dry weight would be required by each man daily. A ship's company of 1,200 men would require 600 lb daily and these must all be spread out in shallow perforated trays which would take up a great deal of room. Moulds are apt to grow on peas whilst they are germinating and render the product unappetizing in appearance. Secondly the pulses when germinated must be boiled rapidly for not more than half an hour. Prolonged stewing destroys the vitamin and it would be difficult to boil so large a quantity of peas daily in a ship's galley and serve them up in a palatable form. Thirdly it is anticipated that it would be difficult to persuade the men to eat this ration in such large quantities and it would be impossible to make certain that every man ate his share. Haricot beans especially are hard and unappetizing when prepared in this way but peas are said to be palatable when properly cooked. Each man would have to eat [illegible] of cooked germinated peas daily for the pulses gain weight on being soaked and cooked. Nevertheless this form of antiscorbutic would be invaluable in case of emergency and has the further advantages that marrowfat peas which are most suitable for the purpose are easily stored and of high caloric value for their bulk and they are also a good source of vitamin B which is not reduced in potency by germination. The method of germinating peas is described in an appendix to this paper.

Potatoes are usually obtainable even when other fresh vegetables are scarce. Cut into fine slices and eaten raw they were found by Will[illegible] (1920) to be an effectual remedy for scurvy. [illegible]kane (1856) used raw potatoes sliced up and mixed with molasses during the Grinnell Arctic expedition and found the mixture effective but remarks: "Like doctor stuff generally it is not appetizing. [illegible] it is as much as I can do to persuade the men to shut their eyes and bolt it."

Cooked potatoes especially those which have been stored in the tropics probably have little antiscorbutic value. Still (1921) has found that a "cream" made from baked potatoes is efficacious in preventing infantile scurvy.

[illegible] the addition of tinned tomatoes [illegible] Naval [illegible] have been shown by Givens and McClugage (1919) (1) and [illegible] to be equal to lemons in antiscorbutic [illegible] and the antiscorbutic [illegible] only partly destroyed by tinning so that [illegible] brands of tinned [illegible] have from one third to one-half the [illegible] of fresh lemon juice (Hess and Unger 1918) (Sherman, La Mer [illegible] Campbell 1921) (Bassett Smith 1921) South African tomatoes are [illegible] inferior in antiscorbutic powers to American or English samples [illegible] fresh English [illegible] not always so potent as the lemon [illegible] some samples of canned and bottled English tomatoes were [illegible] Dell (1924) to have lost three quarters of their original value and [illegible] more further on keeping for four years The loss of antiscorbutic [illegible] depends upon the method of tinning, and samples could, no doubt [illegible] for naval use which would prevent scurvy if eaten to the [illegible] daily provided they were merely heated for a short time [illegible] being served Prolonged cooking would probably destroy the [illegible] reliance is to be placed upon this food as an antiscorbutic a [illegible] delivery will have to be tested on guinea-pigs

[illegible] would be an excellent addition to the naval diet [illegible] the tropics and when fresh vegetables were unobtainable but [illegible] they would be somewhat bulky as a ship's [illegible] 1,200 men would require about two hundredweight daily and [illegible] is low Moreover some of the men would [illegible] no data are available as to the loss of vitamin [illegible] in a tropical climate or at 37° C

[illegible] (1921) concentrated lemon juice *in vacuo* over sulphuric [illegible] and made up the resulting syrup into tablets with [illegible] tragacanth Each tablet contained the residue of [illegible] the juice of half a lemon These tablets when fresh had [illegible] the potency of the equivalent amount of fresh [illegible] twelve months at room temperature their [illegible] third of the original lemon juice When stored [illegible] darker in colour within three months and their [illegible] impaired Micklin and Hussey (1921) and [illegible] suggested that the concentrated syrup might be [illegible] antiscorbutic observing that it keeps well

[illegible] effective and compact antiscorbutics but the [illegible] The concentrated juice could be diluted and [illegible] but although the product as prepared in the labora[illegible] plant is at present available for its manu[illegible] it would be necessary either to manufacture [illegible] lemons are grown or to import whole lemons into this [illegible] manufacture the syrup here Two samples of lemon juice expressed [illegible] in Messina and sent to this country for concentration [illegible] Bassett Smith (1921) to have lost all their antiscorbut ... is unusual. The installation of plant to concentrate the syrup at Messina would probably be impracticable and the importation of lemons in good condition into this country would be expensive even after the necessary plant to concentrate the juice had been installed.

Harden and Robison (1919) (1920) and Robison (1919) have dried various fruit juices under reduced pressure at low temperatures, and Givens and McClugage (1919, 2) have dried fruit juice by the Merrell Soule spray process commonly used to dry milk. The resulting products from orange juice and certain other fruits all contained vitamin C in a concentrated form and maintained their potency when stored for more than a year at room temperature, but dried orange juice kept at 20° C. in a sealed vessel for fourteen months by Harden and Robison had lost more than 80 per cent of its power.

Harden and Robison recommended that fruit juices should be concentrated in a Kestner evaporator to the consistency of a syrup or jelly. A reliable and compact antiscorbutic could no doubt be obtained by this method, but close supervision would be necessary during manufacture. If the Admiralty desired to test the efficacy of these products they would presumably have to pay for the necessary machinery to be installed. This would be expensive, and there is no certainty that the products would be found to keep well under Service conditions, nor that the product as manufactured would be as good as that prepared in small quantities by the investigators mentioned.

Dried orange juice and dried lemon juice are manufactured in America by the Merrell Soule Co. of Syracuse, N.Y., and are said to retain antiscorbutic properties for a year. It would, however, be difficult to mix antiscorbutic in the form of dry powder into a palatable drink for issue to a ship's company.

Dell (1920) preserved oranges by heating them in closed cans. The total duration of heating was about half an hour and the temperature rose gradually from 80° C. to 100° C., remaining not more than five minutes at 100° C. After storage for five months at laboratory temperature the juice of these oranges had an antiscorbutic potency approximately equal to that of fresh orange juice. Dell remarks, however, that the oranges were bitter and not suitable for human consumption.

Zilva (1924) has prepared a decitrated and very much concentrated form of lemon juice which can be kept *in vacuo* for at least six months without losing its very great antiscorbutic properties. This juice has since been further concentrated by removal of the sugar by fermentation and by precipitation of the vitamin with lead acetate (Zilva 1924, 1925). The resulting product is a remarkably potent antiscorbutic and could probably be preserved in very small bulk for long periods, but its preparation in large quantities would necessarily be expensive and it may be doubted whether it would, when commercially prepared, be as satisfactory as the samples prepared by skilled workers in the laboratory.

Davey [illegible] juice by [illegible] fruit [illegible]. The resulting [illegible] bottled. The [illegible] proportion [illegible] as a preservative [illegible] without any sterilization [illegible] kept well even [illegible]. Little was frequently [illegible] from [illegible] one half the potency [illegible] after storage [illegible] about eighteen months [illegible]. At 0° C. they maintained a greater [illegible]. These products could easily be prepared [illegible] might prejudice them [illegible] keeping at [illegible] C. in a few weeks and [illegible] so that they would have to be kept in cold storage [illegible] would be fairly bulky. Samples of lemon juice [illegible] preserved with sulphites did not maintain their [illegible] temperature but were potent after two [illegible].

[illegible] it appears that few forms of concentrated [illegible] at the present time. If machinery were [illegible] manufacture [illegible] products it would entail expenditure [illegible] might prove to have been wasted if the antiscorbutic when [illegible] was found not to keep well under Service conditions. [illegible] essential that the fruit juice should be expressed from [illegible] fruit and that it should be immediately concentrated [illegible]. This could only be done by installing machinery where the [illegible] by importing the whole fruit in good condition which [illegible] expensive.

The [illegible] orange and lemon juice preserved with the [illegible] prepared by Miss Davey could probably be prepared on a large scale at a reasonable price in the fruits are grown. Close supervision by an Admiralty [illegible] would probably be necessary, and the product when made would have to be kept at a temperature not exceeding room temperature in England. In the tropics it would probably have to be kept in cold storage. At least [illegible] fluid ounce would be required by each man daily, so that a three months' supply for a ship's company of 1,200 men would be [illegible] gallons, which would take up about 300 cubic feet of space. Such [illegible] space would not be available in the cold storage of a warship [illegible].

During the last eighteen months experiments have been made at [illegible] a product which seems to be suitable in many ways for [illegible] in the Navy. This product is a concentrated [illegible] manufactured by the Exchange Orange Products Co. of [illegible], California, and marketed in England by Messrs. J. Nathan and [illegible] the proprietors of Glaxo. The juice is actually being manufactured [illegible] on a large scale for use in fruit drinks. It [illegible] at a low price because it is prepared from the fresh [illegible] when [illegible] [illegible] [illegible]

The [illegible] [illegible] The low pressure enables the concentration to be [illegible] at a low temperature in the absence of oxygen. The juice [illegible] with any metal meanwhile. For these reasons the [illegible] destroyed in the process. Sufficient cane sugar to make [illegible] final product is added to it and the bulk of the concentrated [illegible] to one sixth or one-seventh of the bulk of the [illegible] The cane sugar acts as a preservative and improves the [illegible] preservative is necessary.

Analysis of the juice showed it to have the following composition: —

Reducing sugar as dextrose	[illegible]
Cane sugar	[illegible]
Protein (N x 6.25)	[illegible]
Free acid as citric	[illegible]
Ash	[illegible]
Undetermined	[illegible]
Total solids	60 [illegible]

Salicylic acid, salicylates, benzoic acid and benzoates were absent, as also were lead and copper.

Reference to the record of feeding experiments which follows will show that two batches of guinea-pigs were fed upon a diet containing no vitamin C, and that they were protected from scurvy in most cases by a daily dose of 0.3 c.c. of this concentrated juice (Series I and II). The juice used had been shipped from America and kept at warehouse temperature for several months before it was used for feeding animals. It is probable that the concentrated juice when not more than a few months old had at least three times the potency of an equal volume of fresh orange or lemon juice.

Storage of the same juice in the ice chest at about 8° C. for a year or more impaired the antiscorbutic power slightly; it was probably still twice as potent as fresh orange or lemon juice (Series III).

The same juice stored at room temperature (about 18° C.) for 12 weeks was probably roughly equal in potency to an equal volume of fresh orange or lemon juice, but it became noticeably darker in colour and the flavour was somewhat impaired (Series IV).

The same juice stored at 37° C. for 19 weeks lost all its antiscorbutic potency and became dark and unpalatable (Series V).

Storage at temperatures varying from 8° C. to 37° C. for 21 weeks reduced the antiscorbutic potency to about one tenth; one quarter of the time was spent at 37° C. and this temperature was mainly responsible for the deterioration (Series VI).

Addition of rum to the juice before storage at 37° C did not cause the antiscorbutic potency to be retained (Series VII)

Experiments are still proceeding with samples to which rum has been added before storage at different temperatures but the rum appears to impair the keeping qualities of the juice

From these experiments it seems that concentrated orange juice could be [illegible] to ships with a potency at least three times as great as that of an equal volume of fresh lemon or orange juice and it is probable that this potency could be maintained with but slight impairment for prolonged periods if the juice were kept in cold storage (about 0° C) It may be [illegible] that the ice chest in which the juice was stored at Greenwich seldom produced a temperature lower than 8° C and several times during [illegible] the temperature rose much higher owing to lack of ice

It is probable that [illegible] of fresh orange or lemon juice daily would protect a man from scurvy although his diet contained no other vitamin C [illegible] therefore anticipated that about 5 c c daily of this concentrated [illegible] would be a sufficient ration for an adult man having no other supply of vitamin C This ration might be issued as five-eighths of a [illegible] of the concentrated juice per man twice weekly which would [illegible] 12 American gallons or 10 English gallons for a ship's [illegible] 1 200 men weekly such ration to be issued upon order of the [illegible] when other antiscorbutics were scarce

If ships were employed under war conditions in the tropics their supplies would probably have to be sent for long distances in supply ships [illegible] warship would probably have to carry food for three months on board This would necessitate reduction of bulky food of low calorie value such as vegetables and fresh food to a minimum which could only be done without impairing the health and efficiency of the men by providing vitamin C in [illegible] other form

No antiscorbutic so far investigated has been able to withstand prolonged storage at 37° C and even at room temperature most antiscorbutics deteriorate to one half or one third of their original potency within a year or two It will probably be necessary to keep any antiscorbutic in cold storage in the tropics and it is in the tropics that an antiscorbutic will be most required For this reason it will be necessary to use a concentrated antiscorbutic and few such substances are available at a reasonable price 120 English gallons of concentrated orange juice would be a supply sufficient to make two issues weekly for three months to a ship's company of 1 200 men Other antiscorbutics such as fresh vegetables and meat would probably be available to some extent even under war conditions so that one half or one third of this amount say 50 English gallons, would probably be sufficient and this if suitably packed would take up a negligible amount of room in the cold storage of a warship

It is essential that an antiscorbutic should be palatable The concentrated orange juice when fresh or kept for prolonged periods in the ice chest may be diluted to make six or seven times the original volume. It then has the exact appearance and flavour of fresh sweetened orange juice. It is extensively used in this country for making orange drinks at soda fountains. For instance it is said to be used at a well-known store in Oxford Street. Before issue to the men it would probably be best to dilute the product so as to make each man's weekly ration about 4 oz.; or it could be diluted more and made into a long drink, but is inclined to be somewhat mawkish if too much diluted. This difficulty can be met by adding essence of orange to increase the flavour.

Storage of the concentrated juice at 37° C. caused it to turn dark brown rapidly; bubbles of gas were also evolved. The change in colour was also noticeable after prolonged storage at about 19° C. but was negligible when the juice was stored in the ice chest. The change of colour is apparently due to a reaction between amino acids and reducing sugars present in the orange juice with liberation of CO_2 from the carboxyl group of the amino acids. The residue of the amino acids combines with the sugar molecules giving rise to a variety of dark coloured compounds of the classes called melanoidins, humins &c. A similar reaction takes place when sweetened condensed milk, molasses or malt extracts are kept at a warm temperature. The CO_2 evolved caused some of the bottles to froth when they were opened, but no bubbles of gas were seen in the bottles kept in the ice chest or at room temperature. The loss of antiscorbutic potency seemed to be proportional to the change in colour; possibly the vitamin C is in some way destroyed by the complex chemical reactions taking place.

Samples of concentrated orange juice were mixed with rum so that the mixture contained 8 per cent. by volume of alcohol. Rum 40° over proof was used, similar to the rum which is at present added to Navy lime juice. This treatment appeared to impair the keeping qualities of the orange juice. Some chemical reaction with evolution of gas began to take place at once, and bottles stored at 37° C. were inclined to blow out their stoppers and froth over. Moreover many spore-bearing bacilli grew in the juice and were recovered on plating out the juice after storage at 37° C.

On the other hand, organisms did not grow in the untreated concentrated juice, no matter how it was stored nor how many times the bottles were opened. An occasional colony of *B. subtilis* or *B. mycoides* or staphylococcus was all that could be found on plating out samples from many bottles. Samples of the orange juice were heavily inoculated with various moulds and with dust and dirt; samples were also exposed to the air of the laboratory for hours and then incubated at 22° C. and at 37° C. No growth of organisms took place, and the only change noticed was that the juice dried up into a solid cake. One sample however underwent some kind of fermentation after it had been left in an unstoppered bottle for about three months. Bubbles were evolved and the juice had a froth and a smell like fermenting marmalade. On dilution it was still pleasant to taste but not so sharp or highly flavoured. No organisms were recovered by aerobic cultivation.

[illegible] water [illegible] [illegible] [illegible] the sugar [illegible] [illegible] before [illegible] state

[illegible] for 126 cases [illegible] estimated that [illegible] would cost 2½d. [illegible] and it is necessary to [illegible] juice. This increases the [illegible] About £9,000 per annum is [illegible] costing nearly £3,000 [illegible] drink is supplied to the [illegible] It [illegible] of lime juice were [illegible] substituted for it a potent [illegible] beverage and about [illegible]

[illegible] all the juice to the [illegible] above because of the [illegible]

[illegible] were adopted it would [illegible] to see that [illegible]

[illegible] advantage that the juice is manu[illegible] It is however essential that an [illegible] as soon as possible after it is [illegible] most suitable crude materials [illegible] of setting up plant to manufacture [illegible] would be prohibitive.

[illegible]

[illegible] including [illegible] weight. They were [illegible]

[illegible]	1 part by weight
[illegible]	2 parts [illegible]
[illegible]	1 [illegible]

[illegible] process, and probably [illegible] little [illegible] which might still be [illegible] it was [illegible] before mixing [illegible] in tins which [illegible] the animal was [illegible] [illegible] holding.

[illegible] but the [illegible] the [illegible] Vitamines, including [illegible] of [illegible]. All [illegible] for the [illegible] twenty [illegible] by [illegible] with orange juice were given the [illegible] with the specified [illegible] concentrated juice was [illegible] quantity for all the [illegible] was [illegible] and thoroughly mixed [illegible] water to [illegible] animal was then fed daily by the writer or by Surgeon [illegible] R.N. with a [illegible] glass squirt. The orange [illegible] investigation was kept [illegible] the ice-chest and was diluted [illegible] necessary to feed the animals.

The animals liked the [illegible] the first few days [illegible] avidity. In some cases it [illegible] necessary to hold them. The animals were weighed [illegible] kept of their weight and condition. These are not [illegible] as they do not show [illegible] pected features. During the [illegible] investigation no animal died from unexplained causes or [illegible]. All the animals [illegible] with well-marked signs of scurvy [illegible] suffering from milder scurvy.

Each animal is designated [illegible] number. All animals bearing the same letter belonged to [illegible]. The number serves to distinguish the members of each [illegible] given in [illegible] indicates the amount of [illegible] daily. Days [illegible] throughout from the time when the [illegible] began.

The test of antiscorbutic [illegible] the animal ten days on [illegible] diet without any antiscorbutic [illegible] animals [illegible] developing scurvy, so that [illegible] when the antiscorbutic [illegible] animals receiving a dose [illegible] growth as rapid as that [illegible] and dryness of the diet [illegible] they often seem to stop eating [illegible] of scurvy.

[illegible]

[illegible] Orange Juice

A 1 male	Grew for 14 days	Died [illegible]th day	P.M.	[illegible]
B 2 female	Grew for 14 days	Died 24th day	P.M.	[illegible]
C 3 female	Grew for 11 days	Died 25th day	P.M.	[illegible]
[illegible] 1 male	Grew for 17 days	Died [illegible]th day	P.M.	[illegible]
[illegible] 2 female	Grew for 10 days	Died 33rd day	P.M.	[illegible]
J 1 female	Grew for 14 days	Died 21th day	P.M.	[illegible]
[illegible] 1 male	Grew for 11 days	Died 27th day	P.M.	[illegible]

[illegible] kept 10 to [illegible] Greenwich and [illegible] to animals

[illegible] then scurvy [illegible]

[illegible] Improved after [illegible] scurvy

[illegible] Improved after [illegible]

[illegible] then grew [illegible] faeces from [illegible] P.M. [illegible] bottle [illegible] normal to [illegible] spontaneously

[illegible] for 30 days [illegible] stationary [illegible] Killed [illegible] P.M. no scurvy

[illegible] days [illegible] Fell [illegible] did not [illegible] P.M. [illegible] signs of [illegible]

[illegible] 11 days grew [illegible] well for 19 days [illegible] 240 grm. P.M. [illegible]

[illegible] 41 days grew well for [illegible] days [illegible] Killed [illegible]

[illegible] 117 days [illegible] killed [illegible]

[illegible] dropped [illegible] 31 days killed [illegible]

[illegible] days stationary 35 days killed [illegible] P.M. no scurvy

[illegible] slowly for 57 days then [illegible] well [illegible] gained 170 grm. P.M. [illegible] Mild chronic scurvy

[illegible] Lost weight slowly 33 days [illegible] gained 176 grm. P.M. no scurvy

[illegible] slowly [illegible] killed [illegible] P.M. [illegible] scurvy

[illegible] well killed [illegible] gained 1[illegible] grm. [illegible]

[illegible] developed fairly acute scurvy

[illegible] one developed mild scurvy

[illegible] well and were normal after 117 [illegible]

[illegible] grew fairly well one developed slight scurvy

[illegible] grew fairly well one developed slight scurvy

[illegible] No scurvy

[illegible] protected the majority of growing guinea pigs from scurvy [illegible] fresh orange juice necessary to prevent scurvy as [illegible] juice was at least three times as potent.

Series II

[illegible] orange juice made in October 1924, kept at warehouse temperature [illegible] kept at Greenwich and kept 5 to 23 weeks [illegible] before feeding to animals.

I 1 [illegible]	[illegible]	[illegible] on 11 days lost weight 11 days, then grew [illegible]. Stiff and [illegible] 40th day. Killed 57th day, gained [illegible]. P.M., mild [illegible] scurvy.
I [illegible]	[illegible] c.c.	No [illegible] for [illegible] days, then grew slowly. Stiff [illegible] between 30th and [illegible]th day. Killed 80th day, gained [illegible]. P.M., old [illegible] knees, mild chronic scurvy.
[illegible]	[illegible] c.c.	Grew slowly for [illegible] days, lost rapidly for 14 days, [illegible] for 7 days. Killed 11[illegible]th day, gained 13 grm. P.M., [illegible] haemorrhages, bones rather brittle, slight scurvy.
I 3 [illegible]	[illegible]	Grew steadily. Killed 90th day, gained 171 grm. [illegible] scurvy.
P 2 [illegible]	[illegible]	Grew steadily. Killed 102nd day, gained 1[illegible] grm. P.M., [illegible] scurvy.
T 1 [illegible]	[illegible]	Grew irregularly. Killed 90th day, gained 1[illegible] grm. P.M., [illegible] scurvy.

Summary.—Two on 0 [illegible] both developed mild chronic scurvy.

[illegible] 0.1 c.c., one grew well, one developed slight scurvy.

[illegible] 0.[illegible] c.c., both grew fairly well, no scurvy.

Conclusion.—This sample of concentrated juice, although [illegible], was approximately equal in potency to the sample used in Series I.

Series III

Concentrated orange juice made in April 1924, kept 10 weeks at warehouse temperature before receipt at Greenwich and then kept from 41 to 64 weeks in the ice chest at about 8° C. This was part of the sample which was used for litters A, B and C in Series I.

R 3, female	Dose 0.33 c.c.	Grew slowly for 35 days, then lost weight rapidly. Died [illegible]th day. P.M., acute scurvy.
S 1, male	Dose 0.33 c.c.	Grew well for 80 days, then stationary. Killed 94th day, gained 170 grm. P.M., no scurvy.
S 2, male	Dose 0.[illegible] c.c.	Growth poor and irregular, no symptoms of scurvy. Killed 93rd day, gained 29 grm. P.M., many haemorrhages, [illegible] junctions disorganized, chronic scurvy.
R 2, female	Dose 0.5 c.c.	Grew steadily. Killed 90th day, gained 116 grm. P.M., no scurvy.

Summary.—These results are difficult to interpret. A larger number of guinea-pigs should have been used. One guinea pig was completely protected for 94 days by 0.33 c.c. daily. This seems to indicate that the antiscorbutic power of the juice was not markedly reduced by prolonged

[illegible]

[illegible] IV

[illegible] in April [illegible] weeks at [illegible] except at [illegible] kept [illegible] varying from [illegible] After [illegible] about [illegible] the period of [illegible] This was part of the sample which [illegible]

[illegible] after 11 days [illegible] P.M. [illegible]

[illegible] P.M. [illegible]

[illegible] 81st day [illegible]

[illegible] gained [illegible] knees no [illegible]

[illegible] 17 days [illegible] Still had [illegible] Killed [illegible] P.M. [illegible]

[illegible] days then rose [illegible] gained 110 gm. P.M. [illegible]

[illegible] growth. Killed [illegible] gained [illegible]

[illegible] and irregular [illegible] and food [illegible] 20 gm. P.M. [illegible] Very slight scurvy.

[illegible] 83 days [illegible] Killed 100th [illegible] gained 153 gm. [illegible] Very slight scurvy [illegible]

[illegible] Killed 11th day [illegible] gained 8 gm. [illegible]

[illegible] scurvy.

[illegible] very slight [illegible] fairly [illegible]

[illegible] well [illegible]

[illegible] very [illegible]

[illegible] developed very slight scurvy [illegible]

[illegible]—The [illegible] of the concentrated juice was reduced to less than one-third by [illegible] for 12 weeks at about 19° C. It was still equivalent to [illegible] volume of fresh orange juice.

Series V

Concentrated orange juice made in April, [illegible] kept [illegible] at [illegible] temperature [illegible] receipt at Greenwich and then kept 19 weeks at 37° C. After that it was kept in the ice-chest at about 8° C during the period of feeding to animals (0 to 6 weeks). This was part of the sample which was used for litters A, B and C in Series I.

G 1, [illegible]	Dose 0·3 c.c.	Grew 17 days	Died 33rd day	P M , acute scurvy
G 3, [illegible]	Dose 0·4 c.c.	Grew 14 days	Died 28th day	P M , acute scurvy
H 1, [illegible]	Dose 0·5 c.c.	Grew 14 days	Died 39th day	P M , acute scurvy
I 1, male	Dose 0·5 c.c.	Grew 17 days	Died 31st day	P M , acute scurvy
I 3, male	Dose 1·0 c.c.	Grew 14 days	Died 29th day	P M , acute scurvy
I 3, female	Dose 1·2 c.c.	Grew 10 days	Died 29th day	P M , acute scurvy
G 2, female	Dose 1·1 c.c.	Grew 10 days	Died 26th day	P M , acute scurvy
H 2, male	Dose 2·0 c.c.	Grew 14 days	Died 33rd day	P M , acute scurvy
H 3, female	Dose 3·0 c.c.	Grew 14 days	Died 29th day	P M , acute scurvy

Summary.—Some of the animals lived a few days longer than control animals having no orange juice. 3 c.c. of this juice gave much less protection than 0·15 c.c. of the original concentrated juice, so that the potency had been reduced to less than one twentieth if not completely destroyed.

Conclusion.—Storage at 37° C for 19 weeks destroyed practically all the antiscorbutic potency.

Series VI

Concentrated orange juice made in April, 1924, kept for 10 weeks at warehouse temperature before receipt at Greenwich and then kept for 24 weeks at temperatures changing once a week as follows: room temperature, ice chest, room temperature, 37° C., room temperature, etc. After that it was kept in the ice chest from 7 to 14 weeks during feeding to animals. This was part of the sample which was used for litters A, B and C in Series I.

K 1, male	Dose 1·0 c.c.	Grew a little 28 days, then scurvy. Killed 55th day. P M , fairly acute scurvy
K 2, male	Dose 1·5 c.c.	Grew a little 28 days, then scurvy. Killed 45th day. P M , fairly acute scurvy
K 3, male	Dose 2·0 c.c.	Grew 30 days, then lost weight for 23 days, then improved for 11 days. Scurvy after 41st day. Killed 59th day. P M , subacute scurvy
L 1, female	Dose 3·0 c.c.	Grew little and irregularly. Killed 59th day, gained 35 grm. P M , no scurvy

Summary.—There was fair protection with a dose of 3 c.c. daily.

Conclusion.—The antiscorbutic potency of concentrated orange juice was reduced to about one tenth by storage at temperatures varying from 8° C. to 37° C. for 24 weeks.

SERIES VII

[illegible] orange juice made in October, 1924 kept at [illegible] temperature [illegible] months before receipt at Greenwich On receipt [illegible] [illegible] over proof (80 per cent alcohol by volume) was added to [illegible] orange juice, and the mixture (which contained 8 per cent of [illegible]) was kept 17 weeks at 37° C It was then kept in the [illegible] weeks during feeding to the guinea pig This was part of the sample [illegible] in Series II

A 1, male [illegible] Grew 17 days. Died 33rd day P M, acute scurvy

Conclusion [illegible] Storage for 17 weeks at 37° C after addition of rum destroyed practically all the antiscorbutic potency

The writer wishes to express his thanks to Surgeon Commander T Creaser R N for feeding the animals when the writer was on leave, to Surgeon Commander S F Dudley R N, for carrying out some of the feeding experiments before the writer had obtained a licence to do so, to Robert C Frederick Esq, Demonstrator of Hygiene at the Naval Medical School for testing the juice for preservatives and poisonous metals and to H Jephcott Esq and A L Bacharach Esq, Chemists to Glaxo, Ltd for their advice and help in connection with the investigation

SUMMARY

(1) No special antiscorbutic is necessary in peace time when ships can get fresh vegetables

(2) In case of war in the tropics fresh vegetables are likely to be difficult to obtain, of poor quality and unsafe to eat unless cooked Lack of antiscorbutic vitamin is likely to impair the efficiency of the fleet

(3) Concentrated orange juice can be obtained from California which is a potent antiscorbutic, cheap compact and palatable

(4) Fifty gallons would probably contain sufficient vitamin C to eke out the scanty supply available on the tropical war diet of 1 200 men for [illegible] months

(5) This orange juice or any other suitable antiscorbutic would have to be kept in cold storage in the tropics Small bulk is therefore essential

(6) Other antiscorbutics which have been suggested are either too bulky, [illegible] expensive or are unreliable or unpalatable

(7) The concentrated orange juice will retain its antiscorbutic power [illegible] unimpaired for long periods if kept in cold storage

(8) Addition of rum impairs the keeping qualities of the juice

(9) If the issue of lime juice were abolished and concentrated orange juice were substituted for it a potent antiscorbutic would be issued instead of a useless beverage, and about £4 000 per annum would be saved

APPENDIX

Memorandum [illegible] Harriette Chick [illegible] Hume [illegible] Journal of the [illegible] Army Medical Corps [illegible] xix, p 217

Method of using Peas or other Pulses for the Prevention of Scurvy in the absence of fresh vegetables

(1) The dry seeds must be whole, retaining the original seed coat, not milled or decorticated

(2) They must be soaked in water for several hours, the time necessary depends on the temperature, twenty-four hours at 50° F to 60° F and twelve hours or less at 90° F

(3) The water must then be drained away and the peas &c allowed to remain in the moist condition with access of air. They will then germinate and the small rootlet grow out. This germination will take forty-eight hours at 50° F to 60° F and twelve to twenty-four hours at 90° F

(4) The operations described in (2) and (3) could conveniently be done under active service conditions in such manner as the following —

Soaking —The peas or other pulses placed in a clean sack should be steeped in a trough, barrel or other suitable vessel, full of clean water, and should be occasionally stirred. The sack and trough, &c, should be large enough to allow for the swelling of the peas to about three times their original size. In a hot climate six to twelve hours should suffice for this soaking

Germination —The peas should be lifted out of the water and spread out to a depth not exceeding two or three inches in a trough or other vessel, with sides and bottom porous or well perforated with holes. This is to allow complete access of air. The seeds must be kept in a moist atmosphere. This is done by covering with damp cloth or sacking, which is sprinkled (by hand or automatically) as often as is required to keep the peas thoroughly moist underneath

All vessels should be clean

(5) It is important that the germinated pulses should be cooked and eaten as soon as possible after germination and not be allowed to become dry again, in that case the antiscorbutic properties, acquired during the process of germination, will again be destroyed. The pulses should be boiled rapidly for not more than half an hour

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THE PHYSIOLOGY OF SOME MEDICAL EXERCISES USED IN PHYSICAL DRILL

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In response to many requests for further information on the above exercises since the publication of former papers in this Journal the following might be of interest especially in view of the attached amendments which are based on these remarks.

Leg deflective exercises are said to quicken the heart and reduce its rate to normal after exercise much more quickly than if no exercises were done. The same effect is claimed for breathing exercises the rate of breathing and the rate of pulse are supposed to be reduced when these are performed after such exercises as running. It is also claimed that both the leg and the breathing exercises have a calming effect on the body [38].

These exercises can be looked at from three points of view from experience in physical training from simple facts and from the general and accepted medical opinion.

(1) *Experience in Physical Training.*—During [illegible] in connection with physical training I have never been able to [illegible] any further blood after heavy exercise into the legs of [illegible] people [illegible] my own.

I have never found that a leg or breathing [illegible] reduced either the rate of the pulse or respiration [illegible] normal sooner than is usual. Indeed the reverse [illegible].

Faced with this which is contrary to some [illegible] looked [illegible] for explanations or support and authoritative confirmation of one's results.

Searching for the origin of these beliefs in deflective exercises one finds that they were based, presumably, on two facts of physiology only partially understood twenty years ago.

It was stated that expiration slows the heart-beat while inspiration increases its rate. It was believed that if after heavy exercise long expirations were given the heart was slowed. It is known now that this form of arrhythmia disappears entirely when the pulse-rate is increased; in fact this disappearance is a diagnostic point for this arrhythmia and distinguishes it from all others [1].

If this is so the advocates of using a breathing exercise to slow the pulse are basing their claims on an alleged physiological reaction which does not exist. Breathing "exercises" do not reduce the pulse-rate or calm the heart. The rate and rhythm of natural breathing should not be altered, the attention should not be concentrated on the breathing, and above all the arms should not be moved.

The deflective leg exercise is apparently based on the fact that a muscle at work contains more blood than a muscle at rest—" as much as two and a half times more."

(2) *Simple Facts.*—It is advocated by people who apply these leg deflective exercises that they should be done after violent effort, such as "running all out" in long distance cross country racing, and after such severe strains as prolonged tugs-of-war, &c., in order to attract or deflect the blood from the heart to the legs, thereby relieving the heart and reducing its rate of beat.

It is obvious that a man after a cross country run has had a surfeit of leg exercise. His legs are as full of blood as they can be, not only due to the call of already overworked muscles, but also due to the effect of gravity, which, as the heart and circulation weaken, gets stronger and stronger and comes more into force. The blood tends to "pool" in the legs, which tends to anæmia of the brain and the respiratory and cardiac centres; the pulse and respiration get rapid, giddiness is felt and collapse imminent. If that takes place then the body is at last in the right position for recovery, namely lying down.

The difficulty in these cases is to get blood out of the legs and normally distributed again, and nothing should be done to prevent this. The vessels of a muscle remain enlarged even after contraction has ceased [2], and the [illegible] would be removed from the legs. [illegible] the leg can [illegible] prevent this. [illegible] pooled [illegible] veins.

Suppose we [illegible] a leg exercise further, and that after a man had run [illegible] was beginning to exert its power, we could artificially [illegible] hold still more blood, what benefit could possibly accrue? [illegible] exhausted man on his back, massage and raise his legs [illegible]

The effect [illegible] deflecting blood unnaturally from the heart to the legs [illegible] The advocates of leg exercises after heavy exercise [illegible] into consideration that gravity acts on a weakened circulation. [illegible] important practical question especially during anaesthesia when [illegible] which counteract the bad effects of gravity may not be work[illegible] and if the legs are hanging down the result may be serious. [illegible] blood will pool in the legs. The same danger occurs in giving [illegible] to anyone sitting upright. Blood again pools in the legs [illegible]

A similar action of gravity in [illegible] the centres of the brain is seen when a man suddenly and unexpectedly has to spring on to his feet from the lying position. He may be seen to stagger and fall. He is often [illegible] There is a temporary anaemia of the brain because the vasomotor system has been caught napping, and the circulation, instead of being kept evenly distributed about the body, falls and collects in the legs and abdomen as a result of gravity. It will thus be seen deflecting blood from the heart to the legs is unscientific and undesirable even if it could be done after exercise.

Gravity, also, in those who have to stand for a long time and get tired, produces varicose veins in the legs.

The symptoms produced in health by heavy exercise and over-exertion are identical with those produced by slight exertion when the heart has become weakened from other causes [4].

Heart failure means the inability of the heart to maintain circulation sufficiently [5], and the less the efficiency of the circulation the more is the effect of gravity felt [6]. Therefore the exhausted heart after exercise, with a tiring circulation, is very prone to be acted on by gravity, and no blood should be artificially deflected to the legs. The movements of the body and legs during a leg exercise only increase effort and the work of the heart after natural exercise and cause its exhaustion to last longer.

To attempt to slow the rate of the heart beat by strategy or artificial [illegible] when the nervous system is regulating it according to bodily need in a strong and healthy man is undesirable. The relationship of the tissues of the nervous system and circulatory system to one another has existed for many ages and the body only asks to be let alone to regulate itself after exercise and not be interfered with.

A weakened heart from exertion [illegible] and [illegible] I know of no physician who would [illegible] patient with [illegible] heart and swollen legs out [illegible] to do a leg exercise to calm his heart. The heart in either case is unable to maintain an efficient circulation, and cannot put up with any more calls on it, such as the movements of the muscles in the heaving up and down of the body and contraction of the muscles engaged in balancing the body, in a leg exercise a very heavy burden.

(d) *Medical*.—Exertion during any condition where the circulation is deficient and cannot be increased in response to the increased need for blood will lead to a fall of blood pressure, the heart being incapable of supplying enough blood to correspond to the call for the increased flow (vaso dilatation) in the working muscles or legs, or if there is already an increased flow especially if augmented by gravity, fainting may be caused [7]. The same effect is seen in CO_2 poisoning, where even a slight exertion produces fainting with absolute certainty and may be fatal [7].

Respiratory distress is the outcome of a disturbance of the respiratory reflex on account of the heart being unable to supply purified blood to some part of the respiratory system [8], and a leg exercise by deflecting still more blood to the legs would tend to deprive this system of oxygen and prevent the circulation from going to the help of the respiratory system.

The potent effect of a leg exercise in disturbing the heart is well known to physicians who, when testing a heart to find out how soon it can be disturbed or exhausted, request the patient to walk a few steps or to walk, or run up a few stairs. That is, they subject him to effort, a leg exercise is effort.

In some cases a few steps will suffice to bring out all the symptoms of exhaustion. This is what a leg exercise tends to do after heavy exercise. When the heart is getting exhausted it tends to add to the exhaustion and prolong recovery, the "pulse ratio" in each subject increasing in height according to the difficulty of the exercise employed [9]. As the work increases, the rise in pulse rate immediately after the exercise is greater and the time taken for the pulse to return to its original rate longer [10].

Another potent effect of a leg exercise is shown by the fact that the effort of walking, especially uphill or against a wind, is well known to cause an attack of angina pectoris. It has been established that a long and strong contraction of a hollow muscular organ can produce intense pain, and the reflex path has been shown [11]. McKenzie also applies this principle to the explanation of the pain of angina pectoris on the ground that as the heart cannot give this long sustained strong contraction, although the stimuli are there, the heart muscle produces pain on the principle of the "summation of stimuli." For angina does not come on at the first step but after some steps, or after a little while [11].

[illegible] it can be seen that [illegible] stimulated by leg movements, and the continuance [illegible] angina and [illegible] leg exercise [illegible] an effort it is not [illegible] apply such an exercise to [illegible] after heavy exercise. [illegible] will be caused, but [illegible] must be far from calming.

[illegible] walking across a floor or up a few stairs or uphill causes the [illegible] more work than is registered by the quickening of the heartbeat [illegible] the output at each beat is also increased and therefore the [illegible] heart when beating at say 72 to the minute may vary very greatly [12]. For the same reason the work of a heart during a leg [illegible] whatever the pulse may do.

In all tests and experiments the individual nervous effect on the pulse must be eliminated. Pulses do alter when undergoing examination by a medical officer, greatly in examination for health insurance, less so in examination for the ordinary state of health, and least in P. T. examinations if the medical officer is known. A normal pulse rate ranges from [illegible] 80 beats a minute, with an average of 66 lying down, 70 sitting, [illegible] standing [11]. Some authors lessen the range and name an average of 62—81 [15]. The increased muscular expenditure required to move the [illegible] from the sitting to the standing position increases the rate of the heart beat by at least 13 beats a minute [16].

After [illegible] the normal and usual rate of the pulse when the subject is lying down, sitting and standing, regulated exercise can then be carried out by the subject by placing a foot on a chair and standing alternately on the floor, or in other words alternately raising the right and left foot on to a chair. Done at the rate of five times in fifteen seconds and an average pulse after [illegible] is 96 [17]. That is, the pulse is raised after a simple leg exercise.

A good indication of the reaction of the pulse to exercise of this sort is the ratio between the average pulse rate for the two minutes immediately following the exercise and the pulse rate at rest, namely the "pulse ratio" [18]. The circulation rate decreases rapidly in the first two minutes after an exercise and then more slowly [19]. A leg exercise would [illegible] this decrease.

A leg exercise is a balance exercise in addition, for when a leg exercise [illegible] not only do the muscles of the leg contract but the muscles of the trunk in addition. The more tired a man is after running the greater and more widespread is the contraction of other groups of muscles of the body [illegible] to help the legs. This general contraction cannot in any way [illegible] and interferes with the descent of the diaphragm.

[illegible] after heavy exercise has all the elements of "effort" in [illegible] of mind and muscular contraction plus balancing efforts [illegible] exhausting [21].

[illegible] mistake when studying a movement to consider only [illegible] usually supposed to produce that movement. In pushing a [illegible] the shoulder [illegible] and perhaps [illegible] the [illegible] the only [illegible] the entire muscular system shares in the effort. The [illegible] and [illegible] required the muscles that support the shoulder girdle, the muscles that rotate the scapula. These muscles are attached to the ribs and the spine and these have to be supported on the pelvis by the trunk muscles, and the pelvis is supported on the legs, all involving muscular contraction, and the more tired the arm muscles become, the more do the body muscles contract in sympathy. Hence the thorax is fixed and the abdominal muscle contracted.

This spreading contraction can well be seen when using the "grip machine" at piers into which one puts a penny and grips a handle and tries to ring a bell. The grip is a tiring effort, and as one tires more and more muscle groups come into play, and before one lets go the body is bent in a crouched and convulsed attitude in front of the machine, the effort now having spread over the whole body.

The same with the legs, the more tired the legs the more do the other muscles of the body contract during a leg exercise. As intensity of a simple movement increases, group after group of unassociated muscles contract in sympathy [22]. This widespread muscular contraction increases the work of the heart in whatever way the blood may be deflected.

In testing the heart of a trained man great importance is attached to the rapidity of acceleration of the heart-beat on exertion, and the rapidity of its return to normal after exertion is over, and anything imposed on a heart to interfere with this natural return to normal is not good practice.

When the body is at rest the heart overcomes the resistance opposed to its work with ease, employing only a portion of its power. A muscular contraction does not necessarily involve the whole of the thick fibres of a muscle, the number of fibres employed varying with the intensity of the action [23, 29]. At the same time the heart is rebuilding its store energy ready to be liberated when the next call is made by the body for more work. A leg exercise is more work. After severe exercise the store of reserve force of the heart becomes exhausted, and if effort be persisted in the exhaustion will be prolonged. A leg exercise prevents the heart from resting and recuperating.

Of all viscera the heart is most sensitive to stimulation, and the result of stimulation is most readily recognized. This readiness to respond to stimulation is necessary for the demands of economy, for it is on this account that effort can be undertaken with ease and comfort, the heart rate increasing with the demand made by effort [21]. A leg exercise is effort.

In mild rhythmic movements of the body the blood pressure rises gradually, but never attains a great height. It remains up after the exercise has finished but drops to subnormal more quickly than the pulse rate. The pulse rate rises abruptly, remains high, and drops slowly after the exercise

During this period the circulation is carried on with increased force and rapidity [25] A rhythmic leg movement has this effect

The speed and efficiency of recovery of a muscle after exercise especially heavy exercise depends upon its oxidative mechanism of recovery [26] Any muscular movements retard this, as lactic acid will still be produced and the oxygen debt increased [27] Lactic acid is liberated in large quantities with ease in the body on muscular movement Leg exercises keep the lactic acid of the body at a high level and increase the oxygen debt

It has been suggested to me that a leg exercise can be done and have its full effect if a man bent his knees and remained in a crouching position the vessels of the leg being thereby stretched and the blood "deflected" to them from the heart This was put forward as a method of eliminating up and down movements of the body and legs the lifting of either being work I had only to point out that the man was really sitting on his heels, and would be much more comfortable if he sat on a stool

Leg movements as seen above from the simplest to most complicated, increase the work of the heart

Muscular work demands an adjustment of the respiration, circulation and glandular activity to meet the needs of the muscles the co ordination of these systems being carried out by the nervous system [9] As in man true rest is obtained by the great anthropoids only when the body is laid prone upon bed or tree scaffold [41]

Speaking of the upright position Keith says "The researches of Dr Leonard Hill have made us aware of the elaborate mechanism needed to regulate the arterial blood pressure when the posture of the body is changed In the early pronograde primates the vasomotor postural mechanisms must have been already highly evolved, but it is clear that, with each step towards the plantigrade posture of man there must have been further specializations in the reflex centres which control the distribution of the blood and in the structures which support the weight of the blood mass [41] When the heart is exhausted gravity is very likely to upset this elaborate mechanism which prevents the blood of the body pooling in the legs

THORAX

The Weight of the Arms

At the end of a long day's tramp most of us have become aware of a [illegible] aching pain in the region of the shoulders Nor need we feel surprise when we remember the heavy burden we have had suspended from our neck throughout the day the load represented by the upper extremities In a man of average weight the shoulders and arms represent a [illegible] of about 20 lb [41] When the arms are moved and the scapula [illegible] rotate this load is increased to about 28 lb and has to be supported by the thorax

Anyone can test the weight of the arms Hold the right arm out at right angles to the body One arm illustrates the point better than two [illegible] contracts [illegible] the supporting groups of the trunk can be seen [illegible] time the arm will begin to drop in a few seconds [illegible] muscular contraction to the trunk and leg muscles will be seen [illegible] becomes pulled over to the left side the right side of the [illegible] and the spine bent with its convexity to the right [illegible] muscles of the body are now involved from the toes upwards

This illustrates the entrance of the supporting groups [illegible] of the arm muscles as they get fatigued The abdominal [illegible] seen or felt to be contracted, amongst others

The arm can be supported for a short time but the effort [illegible] great, and fatigue comes on rapidly

Nobody would advise the performance of a breathing [illegible] half-pound dumb bell in each hand Yet the addition of half [illegible] the weight of each arm would not add much to the total weight [illegible] the body has to manipulate when moving the arms

Effect of the Weight of the Arms when M[illegible]

When the arms are moved the shoulder girdle has to be [illegible] or depressed as the case may be, and the thorax has to be fixed [illegible] the heavy arms to pivot on a fixed base and also to supply a fix[illegible] the muscles attached to the chest and arm to work from [illegible] fixed by contraction of the abdominal muscles and steadie[illegible] the body has to be balanced while the arms are swinging [illegible] of the legs contract to steady the pelvis This contraction of the [illegible] muscles prevents the full rise of the thorax, and the full [illegible] diaphragm

When the arms are being moved and pivoted on the [illegible] auxiliary muscles of respiration amongst many others are fully [illegible] in moving the shoulder girdle and arms and thus definitely [illegible] action of theirs in raising the ribs The *pectoralis m[illegible]* *[illegible]agnus* for instance cannot move the arm or support the [illegible] the arm is moving and at the same time raise the ribs Wh[illegible] are fixed then they may assist

Neither when the arms are raised can any pull [illegible] elevate them, any muscles tending to oppose the raising of the [illegible] elongated and their tone inhibited [39 40] This inhibition [illegible] of a voluntary muscle brought about by the excitation of its [illegible] is an example of proprioceptive reflex demonstrated by Sherrington [illegible]

The contraction of the abdominal muscles seriously interferes with the movements of the thorax and hampers respiration [illegible] the proper aeration of the apical part of man's lungs diaphragmatic movements are essential [41] In those in whom the abdominal type of respiration is well developed as in man, the respiratory piston has a [illegible] even more when a deep breath is taken [41] and the [illegible] not be hampered When the abd[illegible] attract on movement of the arms some observers can se[illegible] all can feel it

The mere fact that no act[illegible] ment may be seen does not prove that no contraction is taking pl[illegible] The thin muscle fibres of voluntary muscle supplied by the sympath[illegible] non medullated nerves may be very strongly contracted without [illegible] to a casual eye but it can be felt [35] (Cf rigidity of [illegible] when contracting over an appendix which is due to the cont[illegible] the same fibres)

The effects of [illegible] circulation and blood pressure are well known Any interfer[illegible] with this respiration upsets the circulation

An unnaturally forced [illegible] extra thoracic and abdominal pressure [illegible] from the limbs head and neck into the thorax are obstructed If [illegible] is continued the lungs are emptied [illegible] the filling of the right heart is opposed and the blood is dammed back in the peripheral [illegible] the pressure rises to mean arterial pressure The arterial pressure then begins to fall On a deep inspiration now being taken the blood [illegible] the right heart is all used in the filling of the [illegible] empty pulmonary vessels Thus several beats of the left ventricle [illegible] and produce no effect on the system [illegible] the face blan[illegible] the subject becomes faint from cerebral anaemia [28]

Should the breath be held [illegible] expiration this effect on the circulation [illegible] at its greatest When the thorax is constricted by moving [illegible] the same effect is seen to a lesser degree After exercise when the heart and respiratory centres are working normally together artificial breathing [illegible] time to the needs of the body produces the same again

The [illegible] thing is seen as in an [illegible] lifting dumb bells the muscles of the chest wall which support the shoulder girdle come into [illegible] pressing the [illegible] the elastic cushion of the lungs and the arm muscles have a firm basis for action" [29] The ribs [illegible] by the contraction of the abdominal muscles in order that they [illegible] firm base the abdominal muscles also being [illegible] support the trunk on the pelvis while the arms are swinging This prevents the descent of the diaphragm and hinders breathing

In [illegible] the teeth are clenched the [illegible] closing up the air in the lungs where it is still further [illegible] by the abdominal muscles [30] Here the diaphragm [illegible] breathing exercise [illegible] with swinging arms has [illegible]

The pressure in the lungs prevents blood from coming into the heart [illegible] with the great vessels that [illegible] distended and the engorged veins of the neck temples [illegible] becomes purple [31] [illegible] with swinging arms only [illegible] dumb-bells and [illegible] artificial weights, but the [illegible] This last point [illegible] forgotten

We find the greatest strain on the heart and blood vessels in exercises of strength and speed, especially in feats where the arms lift or pull weights, or support the body weight. Such movements involve fixation of the chest walls and interference with, or arrest of respiration (32)

Whatever action the [illegible] of the thorax has on the big veins entering the heart it can only be efficiently brought into play during normal respiratory movements of the chest and is hindered by moving the arms and restricting the range of thoracic movement. If it is necessary for the body to take deep respirations the respiratory centre will be automatically prompted to carry them out. Aiming at uniformity by teaching breathing by numbers so to speak, is bound to fail

Unnatural breathing after heavy exercise, that is the taking of breaths shallow or deep at a different pace than is prompted by nature, is not wise. Human beings have breathed for so many ages that the system has become automatic and does not want or require any interference from outside (33). The spirometer and x rays confirm these remarks

The demonstration of two sets of fibres in voluntary muscle (34) and its interpretation (35) does not alter these facts. For tonus or postural contraction of muscle consists of a contractile element carried out by the thick muscle fibres innervated by the somatic medullated nerves, and a plastic element which fixes the length of the muscle fibres and holds them in that position carried out by the thin muscle fibres of voluntary muscle innervated by sympathetic non-medullated nerves. Probably in actual practice both help each other (39, 40)

Arm movements still further hamper respiration by increasing the pressure in the abdomen. Keith in his Hunterian Lecture says —

"On standing up the pressure on the floor of the pelvis taken from within the passive rectum and registered on a mercury manometer will be found to vary from 1½ to 2½ mm so long as we stand still but the moment we attempt any arm movement particularly if we bend down and seek to lift a heavy weight, the intrapelvic pressure as registered on the manometer, instantly rises to the neighbourhood of 80 to 100 mm. If the effort is made suddenly the initial rise is much greater, reaching as much as 150 mm." (41)

Movements of the arm do not assist respiration, and the greater the fatigue of the body the more do these movements hamper respiration. Head bendings and arm liftings under these conditions do not rise the ribs, the effect of their movement fixes the thorax

Migration of Muscle

The migration of muscle which took place during the change from the pronograde posture to the plantigrade shows how the thorax [illegible] to become gradually freed from the influence of abdominal muscles when they contract. The straight muscles of the abdomen in the human body with its plantigrade posture are inserted into the cartilages of the fifth, sixth and seventh ribs. In the older pronograde forms these muscles are attached to the back of the sternum along its whole length and to the first and second ribs.

With the evolution of the orthograde posture the origin of the straight muscles was withdrawn from the four upper ribs, thus setting them free for a new kind of movement. This retreat of the straight muscles was accompanied by that of the external obliques and scalenus medius [41], and the thorax was freed, the diaphragm could descend and the apices of the lungs aerated.

A man suffering from respiratory distress does not move his arms. He either supports their weight or fixes them. The attitude adopted by a human being in this condition shows the failure of the mechanism for maintaining respiration in the upright position, for he resumes the pronograde posture, back bent, arms extended and the weight of his shoulder girdle supported on his arms which are probably resting on a chair. The weight of his arms are unbearable to him.

Bankhart in "Physiology of Muscular Action" in *Proceedings of Royal Society of Medicine*, November, 1925, says: "There is too much arm- and leg-wagging in the schemes of most gymnasts."

Passive Exercise

The role of passive exercise is one of relief to the nervous system, for the nutrition of muscle is maintained without the expenditure of the nervous force required to make them contract, and massage acts on the central nervous system through the nerves of sense stimulating or soothing according to the nature and amount of the manipulation. Massage and passive movements also disperse waste products. The heart is undisturbed.

Fatigue comes on earlier in exercises when done without preliminary massage; the average result claimed is that after massage the muscles can do twice as much work [3b]. It was also found that five minutes massage had the maximum effect, no further improvement taking place if massage were continued longer than this.

After a hard race or other contest it is a matter of common knowledge amongst trainers that a five minutes treatment of massage will enable an athlete to repeat or continue a performance otherwise impossible [37]. The lying-down position, combined with massage, should take the place of deflective exercises, if such treatment is ever necessary.

Massage differs radically from active exercises in its capacity to feed muscular tissue without fatiguing or even employing the will power. It is the most economic form of exercise on the nervous system and yet its potency is shown by the increase of blood corpuscles and hæmoglobin. It accomplishes these results by decreasing resistance in the peripheral vessels by the removal of waste products and by mechanically moving the blood current forward towards the heart in the lymph spaces and venous channels If the legs are raised this also helps the movement of the blood and if the thorax is allowed to remain in its natural state without arm movements or calling attention to breathing, the necessary automatic deep breathing will take place which by the pump action of the thorax helps to suck the blood into the large veins in the thorax

Passive movements and massage thus stimulate circulation respiration, nutrition and excretion Leg deflective exercises on the face of it can only be tiring and disturb the heart

Finally—so carefully graduated is the Swedish Table and its progression that no bad effect on heart and circulation can occur if the system is properly applied There is therefore no need whatsoever for the introduction of semi medical exercises such as so called deflective or calming exercises Neither is there any need for passive movements or massage except in cases of emergency

The Cult of the Straight Spine

So much can be done by medical men in the correction of abnormal curves of the spine, and the subject is such a difficult one that it is best to leave it in their hands

Altering the curves of the spine deliberately is no part or parcel of a System of Physical Training A good position of the head and an erect carriage of the body should be the limitation of a Physical Training Instructor's ideal If he cannot produce that by ordinary drill and free exercises then a medical officer should be consulted Those who suffer from symptoms due to an abnormal curve of the spine need special medical treatment Blunderbuss treatment applied to the masses in attempts to give everyone a perfectly rod like straight spine is not advisable

Excess of zeal in this direction, especially by non medical instructors leads to exaggerations in descriptions and diagrams, even to the extent of showing a spine as straight as a ramrod and devoid of every vestige of curve These exaggerations lead to exaggerated exercises As a case in point the exercise (St U Gr Span) push up from behind necessitates the application of direct force to the spine accompanied by powerful leverage in an attempt to bend the spine forcibly Such exercises should not be used in a system of Physical Training The old form of service drill with the continual struggle to bend the dorsal spine on wholesale principles was the cause of the irregular heart and exercises as mentioned above seem to me to be more than likely to recreate the condition

Forcibly "opening out of the chest by special exercises tends to overstretching of the lungs and pleura Increased pulmonary capacity does not mean improved "wind and the so called vital capacity is no [illegible] of a man's power of [illegible] [illegible]. A good [illegible] depends on the [illegible] [illegible] working of the heart and lungs and [illegible] found by graduated [illegible] which cause natural and deep breathing and teach man unconsciously to adjust his circulation, respiration and [illegible] activity.

[illegible] losis and a pouter pigeon chest are easily produced by attempts to [illegible] out the spine.

On page 76 of the first edition of "The Descent of Man" Darwin says:

"As the progenitors of man became more and more erect, with their [illegible] and hands more and more modified for prehension and other purposes, with their feet and legs at the same time transformed for firm support and [illegible] endless other changes in structure would have become [illegible]. The pelvis would have to be broadened, the spine peculiarly [illegible], and the head fixed in an altered position, all of which changes [illegible] been attained by man."

AMENDMENTS TO HANDBOOK OF PHY. TRAINING, VOL. I, 1923

Page [illegible]. Chapter XI. Leg Group.

Objects of the Group. *Delete* paragraph commencing "The milder [illegible]" and *substitute* —

A leg exercise after heavy exercise should be omitted, as any muscular exertion only prevents the heart beat from returning to its normal rate, and thereby prolongs the work of an already tired heart.

Page 123. Chapter XXI. Breathing Exercises.

Delete Article 1003 and *substitute* —

No added muscular movement should take place during a breathing exercise. The muscles used during natural respiration, especially the diaphragm, should be allowed to have free play and not be hampered by the contraction of other groups; arms especially should be kept still, hanging naturally by the side.

Article 1004. *Delete* paragraphs 1, 2, 3, 8, 9 and 10.

Articles 1006 and 1007 to be *deleted*.

Article 1008. Heading to be *amended* as follows: —

Article 1008. 1.—CHEST EXERCISES

Exercises without Arm or Leg Movements

REFERENCES

[illegible]	[illegible] JAMES	Symptoms and their Interpretation
[illegible]	[illegible] JAMES	Symptoms and their Interpretation
[illegible]	[illegible] JAMES	Symptoms and their Interpretation

[illegible]

[41] [illegible] 1929

THE AMPHIARAON OROPOS ATTICA

By Surgeon Commander H M BRAITHWAITE [illegible]

The Amphiaraion is a Temple Hospital situated [illegible] of Oropos [illegible] in Attica Greece

As usual [illegible] the [illegible] and miraculous origin is ascribed [illegible] Amphiaraus was a soothsayer priest of Argos and he fled from [illegible] during the [illegible] is associated with Adrastos in [illegible] The story says that Amphiaraus cut open the earth with his [illegible] both he and his weapon were [illegible] and passed through the earth [illegible] came out at the site of the Temple where also a sacred spring gushed [illegible]

Pausanias in his [illegible] to Greece, [illegible] written about [illegible] 100 [illegible] says that Amphiaraus fled to Chalcis and afterwards settled down and erected his hospital at this spring. The buildings are in a narrow [illegible] which runs roughly east and west surrounded on three sides by [illegible] heights, open to the sea distant about half a mile, on the [illegible] In the midst is a deep little gorge with ever running water formerly crossed by a wide bridge.

[illegible] track from [illegible] approaches the [illegible] east end [illegible]

[illegible] buildings [illegible] ruins of the [illegible]. Next [illegible] about [illegible] and [illegible] closed [illegible] the [illegible] was [illegible] provided with [illegible] difficult to visualize the [illegible] the [illegible] arranged [illegible] In [illegible] At the [illegible] and [illegible]

[illegible] Zeus and Apollo [illegible] the third to Hestia [illegible] the sons of [illegible] fourth to Aphrodite [illegible] and Athena [illegible] The fifth to Nymphs [illegible] and [illegible]

The [illegible] of gods, goddesses and [illegible] and the [illegible] they shared the [illegible] is noticeable [illegible]

[illegible] altar with [illegible] in front. In [illegible] of about twenty [illegible] which grateful [illegible] placed statues of themselves. In Roman times [illegible] were removed and replaced by statues of members of [illegible]

[illegible] buildings on the north side of the valley [illegible] they are in a fair state of preservation. On [illegible] Spring approached by a flight of ten steps. It is [illegible] into the gorge.

[illegible] is the hospital. On the west is a row of twenty [illegible] eastwards we come upon a hall presumably [illegible] and numerous small rooms. These were [illegible] and visitors who came at festival times.

[illegible] were not so strongly built as those [illegible] and [illegible]

[illegible] have been discovered inscribed with the rules [illegible] As for example [illegible] of the [illegible] He must visit it at least once every three [illegible] stay at least ten days every month, except at ploughing [illegible] winter months [illegible] He keeps the key of the [illegible] The house governor lives in the hospital [illegible] He must [illegible] patient for admission who must pay a fee of [illegible] money five drachmas. He must put the money in the [illegible] He must keep good order, see that the treatment prescribed by the [illegible] is carried out, keep the men and the women

[illegible]

An interesting situation arose in [illegible] Some Ro[illegible] to pay the fee to the god Amphiaraos [illegible] a god [illegible] of fees The Priest of Oropos went to [illegible] and eventually the case was taken to the Senate at Rome The [illegible] against the priest and the god A good example of Roman [illegible]

Very scanty records remain of the [illegible] patients [illegible] the disorders from which they suffered but the [illegible] and fragments of sculpture show that some surgery was [illegible] and that hydrotherapy and massage were employed There is one [illegible] interesting sculpture showing Amphiaraos incising a patient's shoulder, the patient reclining on a couch and the Sacred Serpent emblem of [illegible] sucking the poisonous matter out of the wound The third [illegible] showing the patient erect with outstretched arms rendering thanks for his recovery

This was the age of Hippocrates, the Father of Medicine so the art of healing had reached a high standard

But the mainstay of treatment was suggestion by the Oracle—as it was called The patient was put to sleep and the Priest [illegible] as the deified Amphiaraos, visited him and spoke telling him what [illegible] that he might be cured He repeated his words many times so that when the patient awoke he believed that the god had come to him and that if he carried out his orders he might recover

It was the custom of the patient on being cured to [illegible] silver or gold into the Sacred Spring

This Temple Hospital flourished for many centuries as testified by the names inscribed on the monuments of well known Greeks and Romans who came as patients Notable among the latter is the name of Sulla

My best thanks are due to Dr Leonardos who spent [illegible] on a hot Sunday afternoon on August 30 1925 in showing me round and explaining everything and who courteously received a party of [illegible] officers next day The initial step was due to the kindness of Dr Welter whom I met at Aegina where he is working for the German School of Archæology on August 26 1925

Naval Medical History of the War.

HISTORY OF THE MEDICAL UNIT OF THE ROYAL NAVAL DIVISION FROM ITS INCEPTION TO THE EVACUATION OF GALLIPOLI

By [illegible] Rear Admiral ARTHUR GASKELL, C.B., O.B.E., F.R.C.S., D.P.H.
Late A.D.M.S. of the Royal Naval Division.

(Continued from p. 291, vol. [illegible])

The advance force under Brigadier General Trotman with his headquarter staff of the 3rd Brigade—roughly 2 000 Royal Marines belonging to the *Chatham* and *Plymouth* battalions with the requisite medical details—left Blandford on February 6, 1915.

The remainder of the expeditionary force of the Royal Naval Division embarked in eight transports at Avonmouth on February 28 and March 1, 1915. The following table gives details of the disposal of the Division on these eight transports:—

Unit	Transport	Medical details
Divisional Headquarters	*Franconia*	A.D.M.S., D.A.D.M.S., 1 Staff Sergeant and 6 rank and file
First Brigade Headquarters	*Franconia*	—
Second Brigade Headquarters	*Grantully Castle*	—
Drake Battalion	*Franconia*	Williamson and 5 water duty men
Nelson	*Franconia*	Parker and 5 water duty men
Deal	*Hawick Castle*	Dykyn and 5 water duty men
Hood	*Grantully Castle*	McCracken and 5 water duty men
Howe	*Royal George*	Schlesinger and 5 water duty men
Anson	*Grantully Castle*	Bullence and 5 water duty men
Plymouth	*Gloucester Castle*	Playne and 5 water duty men
Engineer Units	*Somali*	Reyner and 4 water duty men
Signal Company	*Ayrshire*	2 water duty men
[illegible] Unit	*Cestrian*	Lutback and 4 water duty men
Cyclist Company	*Somali*	—
[illegible] Section	*Franconia*	—
R.M.A.S. Section	*Franconia*	—
[illegible] Section	*Franconia*	—

[illegible]		Transport		[illegible]
[illegible]	..	*Royal George*	..	[illegible]
				[illegible]
				[illegible]
				[illegible]
				[illegible]
				[illegible]
				Sturdee
				Quartermaster [illegible]
				Sergeant Major [illegible]
				and 95 N C O and [illegible]
Second Field Ambulance	..	[illegible] *Castle*	..	Stanford
				Mayne
				Allan
				Foxell
				Burdett
				Gow
				Sparrow
				Sewell
				Ellis
				Quartermaster [illegible]
				Sergeant Major [illegible]
				and [illegible] N C O [illegible]
Third Field Ambulance		[illegible]	..	Lynch
				[illegible]
				[illegible]
				[illegible]
				[illegible]
				[illegible]
				Anderson
				Quartermaster [illegible]
				Sergeant Major [illegible]
				[illegible] N C O [illegible]
		[illegible]		[illegible] N C O [illegible]
Horses		[illegible]		
Mules		[illegible]		

The voyage was practically [illegible] the time [illegible] in instruction, drills, inspections [illegible] the [illegible] dog watches and evenings

The medical officers devoted [illegible] and First Aid and to vaccination of all [illegible] against small pox and typhoid. The calf lymph proved very potent [illegible] a large amount of post vaccination dressings. Every case [illegible]

The medical officers had their time fully occupied [illegible] attending to rather a large number of minor cases of sickness and the medical stores provided for the voyage out, in addition to those supplied to the transports by the various Steamship Companies, were largely drawn upon. A few patients had to be sent to hospital at the main ports of call, viz. Gibraltar, Malta and Port Said.

The transports arrived at Malta on March 7, where they remained for two days and coaled. Lemnos was reached on March 12. Here the men were [illegible] their [illegible] and no attempt was made to straighten [illegible] medical [illegible] and the [illegible] soon [illegible] for the purpose. Accordingly the Royal Naval Division proceeded to Port Said, a few ships [illegible] Alexandria [illegible] Brigadier-General Trotman with his [illegible]

At Port Said the transports berthed alongside the wharves and all the troops encamped close by [illegible]

Before arriving at Port Said General Paris received a warning that troops quartered in Egypt had suffered severely from venereal disease. The A.D.M.S. therefore prepared a carefully worded lecture on the subject and the following memorandum accompanied a copy of this lecture to the Officer Commanding Troops in each transport —

H.M.T. *Franconia*
March 23 1915

Confidential

All the troops under your command are to be fallen in with *all* the Officers and the attached lecture is to be carefully and most seriously read out by the Senior Medical Officer present.

There must be nothing perfunctory in this parade, and, of course, no spirit of levity.

It must be clearly understood that the most serious importance is attached to the subject.

(Sgd.) A. PARIS,
Major-General,
G.O.C. in C. of R.N.D.

Whether this lecture was the cause or not, the fact remains that the Royal Naval Division had practically no venereal disease.

The stay at Port Said proved of great value, all the stores being landed from the ships, sorted and restowed. A complete examination of the medical stores enabled the A.D.M.S. to supply all units with their correct mobilization equipment as far as possible and to collect in H.M.T. *Somali* a small surplus supply and the remains of the medical stores used during the voyage.

As regards the three field ambulances, the A.D.M.S. decided that one should be fully equipped with transport, &c., so as to be absolutely mobile, the other two being considered more or less non-mobile.

In the redistribution of troops in the ships, for which the stay at Port Said gave the opportunity, the two non-mobile Field Ambulances (the 1st and 3rd) embarked in H.M.T. *Somali*, while the mobile Field Ambulance (the 2nd) with all its transport embarked in H.M.T. *Minnetonka* (an additional ship allotted to the Royal Naval Division). Each in the *Somali* had a difficult rôle to play. From the beginning [illegible] and Field Ambulance [illegible] planning the [illegible] of the [illegible]. He and his able assistant, Surgeon [illegible] and naval carpenter ratings so thoroughly [illegible] in the [illegible] *Somali* became almost as efficient as a [illegible] ship and [illegible] of the troops rendered invaluable serv[illegible] the treatment and [illegible] the sick and wounded.

Fleming of the 1st Field Ambulance, Stanford [illegible] Kenny of the [illegible] worked hard to bring the medical efficiency [illegible] Naval Division to a very high standard. During the [illegible] out, and especially at each stopping place, frequent confe[illegible] medical officers were held and every subject bearing on [illegible] in the field was discussed. The fortnight at Port Said en[illegible] put the final touches to the organization of their units. A [illegible] of buildings in a school in the town served as a temporary hospital and depot for redistribution and packing of stores. General Sir Ian Hamil[illegible] inspected the Division while at Port Said and complimented the med[illegible] unit on its efficiency. More men went sick at Port Said than at any other port of call, and after examination at the above mentioned temporary hospital of the R.N.D. the more serious cases were sorted out and sent to the Port Said hospitals. The largest number went to Dr. Hayward's Egyptian Government Hospital, sick officers went chiefly to Dr. Cuffey's Lady Strangford Hospital, and the few cases of infectious diseases were accommodated in Captain Heron's Infectious Hospital.

Before leaving Port Said the A.D.M.S. and a board of medical officers surveyed all these patients and decided as to their disposal, a few being invalided home and the others rejoining the Division when cured.

On April 5 the *Anson* Battalion with Temporary Surgeon Ballance and his five medical unit ratings proceeded by train to Alexandria, whence they shipped to Lemnos to join the covering force for the landing in Gallipoli. The *Anson* Battalion supplied the beach party and part of the *River Clyde* party to land from that ship when she beached herself under Sedd el Bahr.

On April 8 and 9 the Marine Brigade left Port Said for Lemnos. The *Plymouth* Battalion with Temporary Surgeon M[illegible] and his [illegible] medical unit ratings joined up with the 29th Division for the first landing, the remaining battalions rejoining the Naval Division at Skyros.

The main body of the Royal Naval Division and [illegible] troops left Port Said on April 11 and arrived at the little island of Skyros on April 1[illegible].

En route a Turkish torpedo boat attacked the transport *Manit*[illegible] carrying Royal Field Artillery. Three torpedoes were fired at her and all missed. Unhappily, however, about fifty men were lost through [illegible] in manning the boats. The transport *Royal George* appeared on the scene in time to rescue many men; the ship's surgeon and the medical officer of the *H*[illegible] [illegible] Royal [illegible] was at Sk[illegible] taking part in a [illegible] [illegible] [illegible] divisions [illegible] [illegible]

On April [illegible] Skyros the [illegible] an officer of the *H*[illegible] Battalion died [illegible] buried ash[illegible] [illegible] April [illegible] the Royal Na[illegible] [illegible] and after a [illegible] arrived at [illegible] W S W of [illegible] in the evening.

A large fleet [illegible] of war [illegible] to take part in the [illegible] British battleships [illegible] British [illegible] twenty British destroyers [illegible] a Russian cruiser.

The Landing at [illegible]

Sunday, April [illegible] this day will always be [illegible] by the British and [illegible] the carefully prepared [illegible]

The [illegible] Asiatic side of the [illegible] Bay [illegible] of the point of the [illegible]

The [illegible] Peninsula at [illegible] (W) and at two [illegible] (X and Y). The *Plymouth* Battalion [illegible] Marine [illegible] Naval [illegible] landing at Y [illegible] regiment. This [illegible] of medical [illegible] The *Plymouth* Battalion received the [illegible] Meller's [illegible]

[illegible] *Plymouth* B[illegible] [illegible] April 25 1915

[illegible] previously been [illegible] of King's Own Scottish [illegible] company of South Wales Borderers.

[illegible] south-easterly direction. This [illegible] with the party landed [illegible] X [illegible]

[illegible] *Plymouth* [illegible] were guarding the left flank [illegible] King's Own Scottish Borderers and South Wales Borderers were in [illegible] two companies of the *Plymouth* Battalion were on the right [illegible] landing place. The stretcher bearers and [illegible] with three companies. I was with two companies on the right Maj — R A M C had [illegible] on the west of the hill near the landing place with [illegible] wounded there for the night and sending them back [illegible] following day presumably to "W" beach

The party at "X" beach had made no [illegible] it was decided to make no further attempt to get into [illegible]

There were no casualties in the *Plymouth* [illegible] this time it was decided to retire and hold the top of the crest [illegible] a rough semicircle touching the sea on either side Below [illegible] were two gullies and a very steep rocky hillside making [illegible] work almost impossible Below the hill was a narrow strip of [illegible] 10 yards wide extending all along our position

I had established an aid post in the left hand or northern gully The casualties began to come in about 5 p m and 6 p m I had [illegible] this aid post About 8 p m I was asked by the C O [illegible] go to the right flank where there were several wounded with special reference to a slightly wounded officer who was carrying on in the firing line By this time the attack had developed strongly and owing to [illegible] and shrapnel and to the fact that there was no proper trench only a shallow dug out for each man I was unable to reach the firing line

On the hillside below the crest I found many wounded [illegible] battalions engaged These I dressed as required and as far as possible collected into groups in hollows

I was rather at a loss to know what to do with these cases as the crest of the hill was now the firing line and I had completely lost touch with the other medical units I was at this time accompanied by [illegible] medical orderly the stretcher bearers and medical details being employed in dressing the wounded and helping them from the trenches About midnight a signal was sent to H M S *Goliath* asking for a boat to be sent for the wounded Just before dawn these boats appeared I helped my [illegible] wounded down the hill as best I could and found many more [illegible] the beach who had been carried and found there [illegible]

These as far as the boats would hold were sent off to H M S *Goliath* more wounded began to arrive on the beach from all directions many requiring dressings Boats came in from the supporting ships the stretcher cases then walking cases were put into boats This was about [illegible] This took nearly all the first two The wounded went mostly to the *Goliath* and *Sapphire* Arrived on the *Goliath* I worked in the sick bay until evening when the wounded were transferred to Transport *B I* and Hospital Ship *Caroline*

The casualties on April 25 and 26 on "Y" beach were as follows —

	Killed	Wounded	Missing
Officers	1	1	—
Other ranks	27	27	41

The wound [illegible] short

The [illegible] very good [illegible]

(Signed) R W Meller

May 2 [illegible] *Surgeon R N Tempy*

To A D M S

[illegible] Surgeon Meller M O *Plymouth* Battalion

[illegible] Private Hobson 3181 Plymouth Battalion [illegible] hospital

(Signed) R W Meller

Surgeon R N

The [illegible] Battalion (Temporary Surgeon Ballance) went with the [illegible] to form the covering party for the landing at "W" and "V" beach [illegible] Ballance's report is as follows —

From M O [illegible] Battalion

To A D M S R N D

Sir—I have the honour to enclose a list of casualties incurred by this Battalion on April 25

The list comprised —

Officers wounded	2
Other ranks killed –	10
wounded	33

The majority of these casualties were incurred on "V" beach and whilst landing from the *River Clyde*

I myself landed at "W" Beach and did not attend the men on "V" beach

The cases which occurred on "W" beach were placed under the cliff and most of them were removed to ships during the next twenty four hours

(Signed) Alaric A Ballance

Surgeon R N

The attached map gives the rough position of the landing places at the Helles end of the Peninsula and serves for illustrating later stages of the [illegible]

As this history only concerns the Medical Unit of the Royal Naval Division it would be out of place to give any long description of those [illegible] this first landing in which the Naval Division took no part A [illegible] description of this landing is found in Masefield's "Gallipoli"

The composition of the Division on April 25 1915 was as follows —

General Officer Commanding Major General A Paris C B R M A

[illegible] R N Brigade Brigadier General D Mercer R M L I

[illegible] Battalion Commander [illegible] L A Campbell R N

[illegible]son Battalion Lieutenant Colonel [illegible] Eveligh, R M L I

[illegible] (R M) Battalion Lieutenant Colonel R N Bendyshe R M L I

Second R N [illegible] Commander O Backhouse, R N

Howe Battalion [illegible] Colonel G G Collins R M

Hood Battalion [illegible] Colonel J A C Quilter Grenadier Guards

Anson Battalion Lieutenant Colonel H C Moorhouse C M G D S O [illegible]

Third R M [illegible] Brigadier General C N Trotman R M L I

Chatham Battalion Lieutenant Colonel C McN Parsons R M L I

Portsmouth Battalion Lieutenant-Colonel F W Luard R M L I

Plymouth Battalion Lieutenant Colonel G E Matthews C B R M L I

[illegible] Unit Lieutenant Colonel A B Carey R E

[illegible] Unit Major B W Ladington R M

Medical Unit A D M S Fleet Surgeon A Gaskell, R N D A D M S Captain F Casement R A M C

First Field Ambulance Staff Surgeon A L Fleming R N

Second Field Ambulance Staff Surgeon C Stanford, R N

Third Field Ambulance Staff Surgeon F B Kenny R N

The main body of the Royal Naval Division proceeded to the head of Xeros Bay and lay off Bulair during this eventful Sunday making a feint landing in the evening No casualties occurred The *Portsmouth* Battalion ([illegible] Surgeon Playne) joined up with the Australian and New Zealand Divisions for the landing at Z or Anzac beach

On Monday April 26 the Division proceeded at full speed to Cape Helles arriving in time to witness but take no part in a splendid advance by the [illegible] covered by terrific artillery fire from the ships The hospital ships present off Cape Helles were the *Guildford Castle* [illegible] and the [illegible] *Dujmy* [illegible]

[illegible] the [illegible] the *Drake* Battalion (Surgeon Williamson) landed and [illegible] that night [illegible] but had no fighting The A D M S [illegible] was required from the field ambulances of the R N Division All the troops seemed very exhausted but the Corps [illegible] these field ambulances just yet

On Wednesday April 28 the Division returned to Anzac and landed [illegible] First Field Ambulance (Staff Surgeon Fleming) and two Battalions—[illegible] (Surgeon [illegible]) and *Nelson* (Surgeon Parker) Fleming [illegible] still [illegible] on the beach close to the Australian dressing [illegible] There was very little room on the small overcrowded beach, and [illegible] the use of the R N D at Anzac was to be only [illegible] only a portion of his stores were landed In spite of this the [illegible] Field Ambulance did well and received many expressions of praise and gratitude from the Australian and New Zealand troops Over two thousand cases passed through Fleming's dressing station during his fortnight's stay at Anzac The A D M S and D A D M S landed to superintend and help the dressing station and regimental aid posts and on all sides experienced the most cordial [illegible] operation from everyone concerned

Admiral Th[illegible] Maclellan [illegible] of the bombarding [illegible] improvise [illegible] carriers wherever [illegible]

Captain [illegible] helped the A D M S in every way [illegible] A D M S [illegible] Australian Division welcomed [illegible] Medical Unit of the Royal Naval Division The shee[illegible] protected the small [illegible] from dropping bullets [illegible] almost continual [illegible] rain of bullets making the [illegible] the transports [illegible] rather hazardous [illegible] pluck and endurance and [illegible] for a moment failed in their duty

Staff Surgeon Fleming's report [illegible] —

[illegible]
Gallipoli
[illegible] 17 [illegible]

To A D M S of R N Division

Sir —In compliance with your Medical [illegible] of the medical arrangements made and the [illegible] and men of the First Field Ambulance [illegible] ("Z" beach) on April 28 and re-embarked [illegible]

As I got verbal orders that our stay [illegible] hours I consequently landed a limited [illegible] and [illegible] M P s and [illegible] S P s and G S P s [illegible] from G S P [illegible] Two medical [illegible] panniers [illegible] dressings and 200 first field dressings three bell tents [illegible] valises and three medical companions There were two [illegible] and haversacks with each bearer subdivision and each [illegible] squad had a surgical haversack and a water bottle [illegible] in each haversack Each No 4 carried splints [illegible] H M T *Somali*

A field fracture box was also landed Each medical officer [illegible] medical officer's haversack in which he also carried [illegible] tabloids of morphia strychnine and dressings The day after we landed a large box of antiseptic paste was sent to us from H M T [illegible] A D M S and we used this dressing in nearly every case of bullet and shrapnel wounds carrying out the printed directions [illegible] its application on identification labels We found it [illegible] way of dressing wounds especially when there is [illegible] to attend to quickly I also obtained from the Australian [illegible] Medical B[illegible] which was at Anzac Cove several shell dressings which I found [illegible] useful

I should like to mention here that our work brought [illegible] constantly [illegible] contact with the Australian and New Zealand Medical Staff from whom we received every possible assistance and whose kindness [illegible]

[illegible] shall never forget. Colonel [illegible], A M C, Colonel Gibbin, A M C and Major Corbin, A M C are [illegible] I should particularly like to mention [illegible] connection with this.

My orders on landing were to get into communication with Brigadier General [illegible], R M L I, which I did, and informed him that I had [illegible] a dressing station on the beach near the pier made for [illegible] conditions. I also discovered where the regimental aid posts [illegible] of the *[illegible]* and *Chatham* Battalions were, which were about 1½ [illegible] dressing station. I then let my bearer sub division medical [illegible] what these posts were and detailed Surgeon Calthrop with [illegible] to work with and establish under cover an advanced dressing [illegible] the Chatham R A P and Surgeons Pratt and Stewart to do [illegible] *[illegible]* battalion R A P.

[illegible] the *Deal* and *Nelson* Battalions I detached Surgeon [illegible] bearers and gave him orders to work in conjunction [illegible] these battalions and to bring the wounded from there [illegible] "Z" beach.

[illegible] very rough and hilly the work of the bearer sub [illegible] strenuous indeed.

[illegible] that I cannot praise too highly the work done by the [illegible] Surgeons Pratt, Calthrop and Stewart, and they [illegible] all N C O s and men of their respective bearer sub divisions.

The [illegible] the wounded almost from the firing-line get [illegible] which were constantly swept with shrapnel fire [illegible] the beach were several times sniped at by the enemy. [illegible] men to take every possible cover and not to expose themselves unnecessarily but the casualties at times were so heavy that it was found necessary to help the regimental stretcher bearers both of the Marine battalions and the adjacent Australian and New Zealand [illegible].

I regret to report the death of S 137[illegible] Private J Deakin, "C" Bearers, who was killed by a bullet through the skull when carrying a wounded [illegible] the stretcher. The following were the other casualties which [illegible] among the bearers and tent sub divisions:—

S [illegible] Private F Griffiths, "A" Bearers shrapnel wound, buttock, [illegible]

S [illegible] Private H Townsend "C" Tent shrapnel left shoulder and [illegible] severe.

S [illegible] Private H Greenwood, "C" Bearers shrapnel left shoulder [illegible]

S [illegible] Private H Bulley, "C" Bearers bullet left thigh, slight.

S [illegible] Private T S Adamson "A" Bearers, shrapnel through chest, [illegible]

S [illegible] Private A L Hacking "B" Bearers, bullet through left [illegible] slight.

S. [illegible] [illegible] Sergt. [illegible] [illegible] leg, slight.

S. 3210 [illegible] W. H. Farmer [illegible] serious.

All the [illegible] to [illegible]

S. 3381 [illegible] W. H. [illegible] returned to duty.

S. 3473 [illegible] W. [illegible] since returned to duty.

S. 3410 Private G. Bell [illegible] slight, since returned to duty.

I attach reports of [illegible]

As I stated, the [illegible] and the dressing tent [illegible] enemy posted a gun at [illegible] shrapnel bullets came through the [illegible] re-wounded in it. I had the tent [illegible] with $1\frac{1}{2}$ in. boards. This afforded us [illegible] men of the tent sub-divisions worked [illegible] conditions.

I particularly noticed S. 3279 Staff-Sergeant Walch [illegible] A. Metcalf, S. 3326 Pte. [illegible] Gell and S. 3006 [illegible] Corporal Hiney who acted as cook preparing [illegible] wounded, had to carry out his work in a very exposed [illegible] that for the first three days he worked day and night as well [illegible] enant and Quartermaster Scammell's assistance [illegible] as he had to expose himself continually to shell-fire [illegible] duties as Quartermaster. I am very pleased with [illegible] worked. I submit for your special attention [illegible] R.N. This officer, since I have assumed [illegible] Ambulance, has given me most valuable assistance [illegible] taking in his duties, tactful in dealing with the [illegible] a natural aptitude for organization. He [illegible] dressing tent extremely well and carried [illegible] shrapnel fire.

The other tent officers, viz., Surgeons [illegible] Hamilton worked very hard and deserve great credit [illegible] days after landing, officers and men had to work [illegible] as the casualties coming in were extremely heavy.

During the time we were at Anzac Cove 940 [illegible] cases, 1,070 Australians, New Zealand, and Indian cases were [illegible] the First Field Ambulance Dressing Station and placed in boats for transference to hospital ships.

In conclusion I should like to bring to your notice the admirable work done by the Chaplain attached to the First Field Ambulance, Rev. Father [illegible] placed his services [illegible] Station [illegible] expose [illegible] to shrapnel [illegible]

[illegible]

[illegible]

[illegible]

[illegible] *R.N.*

O.C. [illegible]

[illegible] D.M.S. [illegible] Division

[illegible] when the 1st [illegible] Anzac Cove [illegible] submit the following [illegible]

Surgeon H. [illegible] R.N.

[illegible] the [illegible] station on the [illegible] shrapnel fire and [illegible] people in the [illegible] he continued to [illegible] wounded man [illegible] [illegible] Martin.

Witnessed by Staff Surgeon [illegible]

S. [illegible] Private H. Slater [illegible]

This [illegible] got wounded and is now [illegible] hospital [illegible]

On May [illegible] at Anzac Cove this [illegible] had been sniped in Monash Valley and when [illegible] himself.

This was witnessed by Surgeon [illegible]

(Signed) [illegible]

Staff Surgeon, R.N.

O.C. 1st [illegible] R.N. [illegible]

[illegible]

The reports [illegible] officers are [illegible] as follows: —

King [illegible] — [illegible] sub-division [illegible] called for [illegible] Bell (S. [illegible]) [illegible] energy [illegible] Corporal J. [illegible] (S. 3081) and [illegible] particularly well [illegible]

Stewart — [illegible] sub-division [illegible] wounded from [illegible] the [illegible] day April 28 to May [illegible] frequent shell-fire and [illegible] and usefulness are Corporal [illegible] (S. [illegible]) [illegible] (S. 4188).

[illegible] — [illegible] sub-division [illegible] entirely creditable and [illegible]

[illegible] — [illegible] sub-division [illegible] nature [illegible] admirable [illegible]

[illegible] Staff Sergeant Walsh [illegible] exempt [illegible] under [illegible] the work under trying [illegible] Private J. Martin (S [illegible]) smart surgical dressing and has shown marked coolness which [illegible] particularly while [illegible] the suburbs. Private Townsend was [illegible]

Walker's Ridge — [illegible] sub-division. For the first [illegible] the men never lay [illegible] hours, but [illegible] Then behaviour was [illegible] Monash Valley was never [illegible] the night. One [illegible] killed and four wounded. The [illegible] had to carry the [illegible] a very rough road was one [illegible] miles and is [illegible] also to the regimental [illegible] was a severe test [illegible] physical state. An epidemic [illegible] out in the valley [illegible] on account [illegible] provided [illegible] supply. Fresh water and [illegible] this. Private H. Slater (S. [illegible]) has done consistently good [illegible] and was wounded [illegible] rescuing [illegible] stretcher squad [illegible]

A special [illegible] the [illegible] stretcher [illegible] the [illegible] cliff paths and that [illegible] impressed with its ability that [illegible] shall always [illegible] part of the medical [illegible]

The A.D.M.S. had [illegible] selecting names for special mention. He finally selected [illegible] Staff Sergeant [illegible] Sergeants Davis and [illegible] and Staff Sergeant Ward and Private H. Slater (S. 151) [illegible] N.C.O. and men. Several months later the A.D.M.S. [illegible] Sergeant John Pratt.

It has [illegible] that [illegible] Anzac [illegible] N.C.O. [illegible] precipitous [illegible] Sergeant Pratt [illegible] difficulty [illegible] on his own back, regardless [illegible] lacerations he received. He practically [illegible] wounded man and thus brought him down [illegible] little suffering, to the dressing station on the [illegible] Order of December 8, 1915, the announcement appeared [illegible] been awarded the Distinguished Service Cross.

On April 29 the *Howe* (Surgeon Schlesinger) and *Hood* (Surgeon McCracken) Battalions proceeded by sea to Cape Helles and landed there, Surgeon Rivers with the three bearer sub-divisions of the 3rd Field [illegible] [illegible] mel them. The [illegible] medical [illegible] [illegible] bearing stati [illegible] by the [illegible] and [illegible] [illegible] of the Royal Naval Division [illegible] The A D M S of the 2[illegible] Division spoke [illegible] and the A D M S of the Naval Division [illegible] of the bearers. Most of the [illegible] the bearers worked day and night [illegible] two and a half miles of [illegible] the [illegible] of exhaustion and worked [illegible]

[illegible]

To [illegible] L [illegible] A D M S R N D

[illegible]

[illegible] dealt with by the bearer [illegible] May [illegible] May [illegible] The bulk of the [illegible] from 12 0 midnight May 1 [illegible] May 2. The [illegible] are [illegible] incomplete in some [illegible] extremely difficult for the bearers to fill up accurately [illegible] rapid and disjointed nature of the advance and subsequent [illegible]

[illegible] to evacuate wounded from advanced dressing stations owing [illegible] and on these there was no time for entering details. I [illegible] of the R N D officers and men. Fully an equal [illegible] were dealt with and tallies were affixed for [illegible] R A M C clerical staff but I have not included them in [illegible] the bearing was extremely arduous as the cases [illegible] back to the casualty clearing station on the [illegible] at the end of the day that I got into touch with a [illegible] 8th F A and transferred some cases there. It [illegible] highly of the conduct of these men. [illegible] C [illegible] Surgeon Shaw, got too far in front in the [illegible] were actually carrying men out of the trenches [illegible] Sergeant Roberts of this section carried more than [illegible] I am aware that the bearer sub-divisions got [illegible] ensure that this does not occur again. I [illegible] with an advanced dressing station of [illegible] of a mile [illegible] of the first stone column on [illegible]

[illegible] is relieved daily and has nothing in [illegible] medical stores or equipment than [illegible] it has to be obtained from the [illegible] necessarily a matter of time it would be impossible for [illegible] anything like short notice although the bearer sub-divisions [illegible] be despatched when and where needed.

I [illegible] that some transport and some tent section stores, [illegible] H and [illegible] in order that I [illegible] dressing stations [illegible] on land, stores [illegible] otherwise dependent [illegible] we can beg

I would respectfully [illegible] Gallipoli as soon as possible [illegible]

The health of the [illegible]

(Signed) [illegible]
Surgeon [illegible]

P S —I am only [illegible] am to render reports [illegible]

It is well at this stage [illegible] summarise the [illegible] landing of the medical [illegible] of the Royal Naval Division

Attached is this summary in tabular [illegible] —

Medical Officer	[illegible]	[illegible]	Date of [illegible]	[illegible]
Fleet Surgeon Gaskell, A D M S and Captain Casement D A D M S	Divisional Head quarters	[illegible]	April [illegible] [illegible] to transport May [illegible] landed [illegible]	[illegible]
Surgeon Williamson	*Drake* Battn (1st Naval Bde)	[illegible]	April [illegible]	[illegible]
Surgeon Parker	*Nelson* Battn (1st Naval Bde)	[illegible]	April [illegible]	[illegible]
Surgeon Eykyn	*Deal* Battn (1st Naval Bde)	[illegible] *Castle*	April [illegible]	[illegible]
Surgeon Ballance	*Howe* Battn (2nd Naval Bde)		April [illegible]	[illegible]
Surgeon Schlesinger	*Hawke* Battn (2nd Naval Bde)	[illegible]	May [illegible]	[illegible]
Surgeon McCracken	*Hood* Battn (2nd Naval Bde)	*Grantully Castle*	May [illegible]	[illegible]
Surgeon Onslow Ford	*Chatham* Battn (3rd Marine Bde)	—	April [illegible]	[illegible]
Surgeon Playne	*Portsmouth* Battn (3rd Marine Bde)	*Gloucester Castle*	April [illegible]	[illegible]
Surgeon Mellor	*Plymouth* Battn (3rd Marine Bde)		April [illegible]	[illegible]
Surgeon Rayner	Engineer Unit	—	May [illegible]	[illegible]
Surgeon Unthank	Supply Unit			[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Cape Helles
[illegible] ... Surgeon [illegible] ... Surgeon Burd[illegible] ... Rev. [illegible]	[illegible]	*M[illegible]*	[illegible]	Cape Helles
Surgeon S[illegible]	[illegible]	[illegible]	[illegible]	V Beach Cape Helles
Surgeon S[illegible] ... Surgeon Ellis	[illegible]	*B[illegible]*		Cape Helles
Staff Surgeon [illegible] ... Surgeon [illegible]	[illegible]	[illegible]	[illegible]	Cape Helles
[illegible] Surgeon [illegible]	[illegible]	[illegible]	[illegible]	Cape Helles
Surgeon [illegible]	[illegible]	[illegible]	[illegible]	Cape Hel[illegible]

On May [illegible] Maj[illegible] landed at Cape Hell[illegible] command of [illegible] the following units :—

Second [illegible] Brigade
New Zealand Brigade
Composite Brigade (Lancashire Fusiliers [illegible] [illegible] [illegible] [illegible])
Royal Naval Division Divisional troops
[illegible] of the Royal Naval Division [illegible] [illegible]
The First (Naval) Brigade had two battalions (*Nelson* [illegible]) at Anzac
The Second (Naval) Brigade was attached complete to the French
The Third (Marine) Brigade had two battalions (*P*[illegible] and *Chatham*) at Anzac

Of the Field Ambulances the first was at Anzac, the second was [illegible] disembarked from the *Minnetonka* (transport), the third were [illegible] the *Sound* (converted hospital carrier) with their tent subdivisions, while their bearer sub-divisions under Surgeon Rivers were landed before [illegible] at the Helles end of the Peninsula

Actions of May 6, 7, 8 and 9, 1915

In accordance with orders from the D.M.S. to supply three medical officers and twenty ratings, Surgeon Sewell with Surgeons [illegible] Gow and twenty N.C.O.'s and men of the 2nd Field Ambulance were transferred from H.M.T. *Minnetonka* to H.M.T. *Dunluce Castle* to tend the wounded transported by this latter ship to Alexandria.

Also by orders similarly received Surgeon Sparrow and three men of the 2nd Field Ambulance formed a medical embarkation [illegible] at [illegible] beach.

A heavy battle was in progress. The A.D.M.S. made a tour to [illegible] that all his medical dispositions were efficient. Rivers was managing very well. The regimental aid posts were dealing with a large number of casualties. Early in the attack Lieutenant Colonel Quilter, C.O. of the *Hood* Battalion, was shot dead with a rifle bullet through the [illegible]. The A.D.M.S. represented the necessity of landing the remainder of the 2nd Field Ambulance, and while awaiting approval ordered Staff Surgeon Stanford to stand by to land at a moment's notice.

On May 7 Stanford and the remainder of his officers and men [illegible] landed and at once took over the post occupied by Rivers. This latter then reported as follows:—

To Fleet Surgeon Gaskell, F.R.C.S., R.N., A.D.M.S., Royal Naval Division

Sir,—I have the honour to submit the following report of the action of May 6 1915 and of my proceedings up to the date of placing myself under Staff Surgeon Stanford's orders on May 7, 3.30 p.m.

I include a list of the cases dealt with by the bearer sub-division of the 3rd Field Ambulance, R.N.D., during this action. The Royal Naval [illegible] attacked [illegible] Mort [illegible] and [illegible] Surgeon [illegible] and [illegible] respectively [illegible] established [illegible] regimental aid post [illegible] about 200 yards beyond the fifth stone column [illegible] in a small gully to the right of the road [illegible] station was established in Square 168 Y 6 [illegible] camp attached to the [illegible] Field Ambulance [illegible] forward as required to the regimental aid posts [illegible] transporting wounded proved [illegible] very satisfactorily [illegible] the action progressed and casualties became heavier [illegible] possible to undertake extensive transference of wounded [illegible] clearing station on W [illegible] which every available stretcher [illegible] at the regimental aid posts. Patients were accordingly [illegible] on blankets under shelters improvised from [illegible] waterproof sheets and were given hot drinks and such comforts as [illegible] Every advantage was taken of such transport as was available, an N C O being stationed on the road above the dressing station to stop any vehicles such as G S wagons, [illegible] carts and limber wagons capable of carrying wounded back to the base. In spite of these measures, however, a congestion became [illegible] towards midnight when I had twenty-two cases lying under shelters in my dressing station. I accordingly advised their being left there until transport by vehicle could be obtained. I then went to the Indian [illegible] in order to ask the Commanding Officer for the loan of [illegible] carts for this purpose. On my way there I met Colonel [illegible] who very kindly placed a supply column of sixteen Indian wagons at my disposal as soon as they had unloaded their stores. Five of these carts I sent back to the regimental aid post for wounded, and I used eleven for transporting wounded cases from my own dressing station. My remaining cases were made as comfortable as possible for the night, the three medical officers taking alternate watches.

During the day three bearers were wounded:—

S 3485	Keys, William George, Private	B	Section
S 3340	Thomas, Alfred	" C	Section
S 3247	Jennings, Clifford	" C	Section

Keys was struck with a shrapnel bullet on the vertex of the skull, sustaining a compound fracture. I greatly regret to learn that he has since died. He was an extremely hard-willing and capable worker and had performed his duties splendidly until wounded. Thomas received a flesh wound from a bullet in the shoulder (left), and Jennings a similar wound in the calf of the left leg. Neither wound was serious, and I trust they both will make a quick recovery. These three casualties all occurred within a short space of time, and I accordingly stopped sending out bearers until a lull occurred. The behaviour of these men was again [illegible] without one single complaint [illegible] but [illegible] is marvellous During the [illegible] both May [illegible] and May [illegible] they did the most arduous work [illegible] were never tired to volunteer [illegible] It has been the greatest possible delight for me to be associated with them

On the arrival of the 2nd Field Ambulance on the morning of May [illegible] I turned the whole of the bearer sub divisions on to the work of evacuating the wounded down to the casualty clearing station, which work was well and willingly done On the arrival of Staff Surgeon Stanford at about 3 30 p m, I placed myself under his orders

I beg to submit the following names for special mention —

Temporary Surgeon H K Shaw R N who has been of the greatest assistance to me in his resource and fertility in ideas

Sergeant Roberts C Section During the action of May 3, 1915 for great coolness under fire and for gallantry in carrying men out of fire when stretcher bearers were scarce and a retirement imminent I consider this N C O s conduct worthy of substantial recognition

Sergeants Booth and Roberts who remained at the regimental aid posts on May 6 and kept me accurately informed of the number of wounded and number of stretchers required, a thing that was of the greatest assistance during the action of May 6 1915

Sergeant Baseley, who has performed the duties of Quartermaster with great efficiency

I beg to submit that Private Amers, who has performed the duties of chief cook to the unit may be promoted to Corporal

It is impossible to select names from the bearers as yet for all have been equally good

I have the honour to be Sir
Your obedient servant
(Signed) Arthur T. Rivers
Surgeon R N
R N D Bearer Sub-Division and I A
Attached 2nd F A R N D

In the firing line, in the camps and at the landing places we suffered heavy casualties. All the wounded in the firing line had to be collected in the regimental aid posts by the regimental stretcher bearers Thence the field ambulance bearers carried or conducted them to the advanced dressing station From here another batch of field ambulance bearers took them on to the main dressing station where they received further medical attention before being carried to the casualty clearing station at W beach Each of these three stages might be about a thousand yards In spite of the heavy strain on the bearers they completed this evacuation by noon of May 7 Two bicycle wheeled stretcher carriers, borrowed from Lieutenant-Colonel Humphreys of the casualty clearing station proved very valuable for bringing cases from the dressing station to the clearing station. In view

[illegible] passed [illegible]

[illegible] H.M.S. [illegible] Expeditionary [illegible] all the [illegible] medical stores of the Royal Naval Division arriving in the Peninsula were [illegible] No. 5 Advanced Depot of Medical Stores under [illegible] R.A.M.C., established itself [illegible] H.M.T. [illegible] May 24 to a spot on shore close to [illegible] depot our stores [illegible] sent. [illegible] store accounts concerning which Sir Arthur [illegible] orders. However, with considerable [illegible] complicated paper work as well [illegible] satisfactorily rendered. By [illegible] Twenty shells struck the depot [illegible] and eventually in the evacuation [illegible] or destroyed.

Between May 8 and 12 no large engagement took place [illegible] casualties occurred daily from snipers and shrapnel. [illegible] East [illegible] Territorial Division arrived, the A.D.M.S. [illegible] Bentley Mann. For some time this Division depended [illegible] the organisations of the Royal Naval Division, as they found difficulty [illegible] their own medical dispositions.

Clinical Notes.

A SEVERE ILLNESS—PURULENT PERICARDITIS TREATED BY DRAINAGE.

By Surgeon Commander G. [illegible] MOSHEAD [illegible]

The following salient features of a very severe and [illegible] complicated [illegible] occurring in a case treated in the Royal Naval Hospital, Hong Kong, [illegible] 1925 are considered to be of sufficient [illegible] publication at the same time being [illegible] great [illegible] body [illegible] by climatic complications and [illegible] Clinically [illegible] the Hong Kong [illegible] being one of great [illegible] conditions totally antagonistic to the satisfactory progress of [illegible] which taps the vitality of the strongest.

[illegible] was admitted to hospital on April [illegible] pneumonia [illegible] type involving the whole right [illegible] lobe of the left lung. Prior to admission [illegible] two days. [illegible] pleural friction accompanied by very [illegible] present in the right axillary region and later [illegible] however never caused any anxiety.

On May [illegible] effusion into the pericardium [illegible]

On the morning of May 2 he was very [illegible] all the [illegible]

[illegible] cardiac and [illegible] [illegible] Pr[illegible] [illegible] thick yell[illegible] proved later to be [illegible] aspirated [illegible] syringe affording a [illegible]

O[illegible] chloroform and ether administered by the open [illegible] stimulants hypodermically the fifth left costal [illegible] were resected exposing the pericardium, which [illegible] large quantity of thick pus unmeasured but [illegible] of [illegible] two pints

[illegible] operation [illegible] on account of the ease of access to the p[illegible] the [illegible] rapid procedure in an almost moribund p[illegible]

[illegible] established [illegible] a short flanged empyema tube to the [illegible] parietal pericardium

[illegible] rallied wonderfully after the operation and was almost free from [illegible] respiratory distress [illegible] the following three weeks were fraught with [illegible] the patient wasted greatly and his mental condition was one of [illegible] and failure to recognize the seriousness of his state Sleepless[illegible] symptom and attempts to get out of bed were frequent

[illegible] artery gave any indication of the athetic condition of the [illegible] could only be judged by the ocular demonstration through the [illegible] chest wall of a heart working regularly and strongly, at a rapid [illegible]

[illegible] these three weeks the pericardial sac was washed out night and [illegible] with a solution of acriflavin and later with hypertonic saline [illegible] The discharge of pus lessened and grew thinner, finally coming away [illegible]

[illegible] this period that pus was noticed to be welling up between the side [illegible] and the parietal pleura This was considered to be caused by [illegible] having given way at a lower level and pus collecting between [illegible] the left lung and the diaphragm Discharge of pus from this track [illegible] that from the pericardial opening decreased but as both areas [illegible] drained by posture pyrexia being negligible, and from a [illegible] point of view the patient being on the upward grade, well was let [illegible]

[illegible] and waiting period which followed witnessed the development of [illegible] complications The liver became very engorged by passive con[illegible] followed by ascites and very marked oedema of the lumbar region genitals and lower limbs The urine passed decreased to 20 oz *per diem* and was loaded with albumin and red blood cells The ascites was aspirated on four occasions to relieve pressure symptoms which were seriously interfering with digestive functions and impeding nutrition Reaccumulation was rapid on each occasion These complications persisted until the middle of July, when by the return of pyrexia and the physical signs at the left base, it became evident that drainage of the chest was unsatisfactory At this time the general condition of the patient had improved his mental condition was normal, appetite good and the upper part of the body was showing increased fat and muscular development The pericardium however was still open and peripheral pulsation was paradoxical

A general anaesthetic was judged to be hazardous. On July 24, under scopo[illegible] morphine hypodermically novocain locally, and light open ether the latter [illegible] as a cardiac stimulant large segments of the sixth and seventh ribs were resected in the left subaxillary region, exposing the diaphragm and base of the left lung Inflammation had considerably altered the anatomy of the region, but structures were recognizable

The base of the left lung was stripped off the diaphragm upwards, exposing [illegible] smaller [illegible]

[illegible] on the [illegible] from [illegible] and [illegible] rapid [illegible] The [illegible] gravity [illegible] and finally became [illegible] dimensions

The constitutional improvement [illegible] and strength He commenced to do [illegible] chest exp[illegible] on August 8 By the aid of massage th[illegible] up to size and tone The heart's area [illegible] adventitious sounds whilst the radial pulse [illegible] rose from his bed and commenced [illegible] August [illegible] activities have increased daily with no [illegible]

I have refrained from giving [illegible] symptoms which in so prolonged and se[illegible] or negatived Such would cover [illegible] paper [illegible] that his pneumonia resolved slowly [illegible] from pericardial pressure but at no time was th[illegible] either pleural cavity

Radiographic examinations of the ches[illegible] For both operations I am much indebted to Surgeon [illegible] Williams for his skilled administration of the [illegible] To Surgeon Captain Clarke [illegible] I am indebted for his unfailing encouragement and appreciation [illegible] my treatment of the case A period of many problems and much [illegible] the pluck and fortitude of the patient through darkness to dawn [illegible] can give adequate representation His patience and courage have [illegible] greatly towards what has been achieved

Of the ultimate prognosis it is at present too early to hazard an opinion, but convalescence is firmly established and the necessity for change of climate and environment is imperative The case will thus pass out of our hands

CLINICAL NOTES FROM R N HOSPITAL PLYMOUTH

Five Biliary Tract Cases

The following five cases of diseased conditions of the biliary tract were operated upon in the R N Hospital, Plymouth one in January and four in March of this year Such cases are somewhat infrequent in naval hospitals and as this series occurred during such a short period the symptoms of each case and the varying conditions disclosed by operation became of particular clinical interest and educational value For this reason they are communicated

Case 1 — A aged 66 was admitted to hospital as an urgent case and diagnosed as acute cholecystitis He had a history of two previous attacks of acute pain over the gall bladder the first eight weeks the second three weeks ago and the present symptoms, more severe than those had commenced forty eight hours ago

[illegible] peration [illegible] for operation [illegible]

[illegible] appeared to be [illegible] substance [illegible] to be [illegible] packed with [illegible] small that [illegible] palpation of the gall bladder.

[illegible] given a negative result [illegible]

[illegible] gall stones [illegible] previously and [illegible] colic attacks [illegible]. Although [illegible] these attacks were accompanied [illegible] temperature [illegible] gall bladder area and the [illegible] fingers. The [illegible] more to the duodenal [illegible] obstruction [illegible] head of the pancreas was found [illegible]. At first [illegible] to be a new growth [illegible] and hard [illegible] the diagnosis certain. [illegible] cystotomy and drainage [illegible] chance of [illegible] all the symptoms and [illegible] only [illegible] but also increased his weight [illegible] that [illegible] caused the trouble. [illegible] which had been rather [illegible]

[illegible] of admission gave [illegible] for a major [illegible] to prepare him by the administration of [illegible] the copious hemorrhage which made [illegible]

[illegible] the abdomen through the outer portion of the right [illegible] being [illegible]. In all except the [illegible] In that case a transverse [illegible] exposure.

[illegible] Subphrenic Abscess

[illegible] aged [illegible] with the following history —

[illegible] had a sudden attack of acute pain in the right [illegible]

[illegible] 102.4 F. a pulse of 114 and [illegible] pain in the right loin, but [illegible] were no other physical or subjective [illegible] with respiration. His heart and [illegible]

[illegible] (0) and passed three ounces of clear [illegible]

[illegible] abdominal symptoms—no physical signs [illegible] definite fulness could be made out in the [illegible] the right loin had become more acute [illegible]

[illegible] indication of appendix disease. Leucocyte count [illegible] per cent.

[illegible] he had another rigor (T. 105 F.), followed by [illegible] complained of acute pain in the right loin. The [illegible] inflammatory conditions, and his bowels had been [illegible]

[illegible] T. 100 F. P. 100 R. 24. He had had a [illegible]. He complained of much pain in the same place [illegible]. His abdomen was still quite soft. Twelve ounces [illegible] passed.

[illegible] of [illegible]

[illegible] Mala [illegible]

A ray report [illegible] the region of [illegible] upper [illegible] suggestive [illegible]

July 21. Operation [illegible] oblique incision [illegible] the right loin [illegible] lumbar [illegible] infection welled up [illegible] but the [illegible] passing [illegible] abdominal wall [illegible] the exposed [illegible] the loin [illegible] It was [illegible] considered that the [illegible] appendix with abscess formation which had [illegible]

A large drain [illegible] to the lumbar [illegible] wound [illegible] on his back and the [illegible] opened by [illegible] gangrenous appendix retrocaecal [illegible] abscess [illegible] was removed.

A large [illegible] to the [illegible] is placed in [illegible] wound closed. [illegible] a good recovery and the case [illegible] as being [illegible] physical signs prior to operation.

The [illegible] stercolith.

A Case of [illegible] Duodenal Ulcer in a Boy aged 16 Simulating [illegible] and later Appendicitis

X., a boy aged 16, was [illegible] R.N. Hospital, Plymouth, [illegible] 1925, with the following history: —

At 3.30 p.m. on day of [illegible] patient was suddenly seized with [illegible] abdominal pain and collapsed [illegible] seconds. On being taken to the [illegible] he recovered somewhat but still complained of acute pain in the right [illegible] abdomen, especially in the region of McBurney's point. Temperature [illegible], pulse 80, respiration 32.

On admission into hospital. Patient lay with knees drawn up. Respiration quick and shallow [illegible] guarding, no vomiting [illegible] tenderness elicited anywhere in particular. Lungs were normal. [illegible] count 14,375. Polymorphs 71·5 [illegible]

March 27. Patient had had a [illegible] night, only sleeping for [illegible] No vomiting. He stated that [illegible] pain [illegible] when he took a deep breath. He was [illegible] tender [illegible] and his muscles were on guard. No abdominal distension. Temperature [illegible], pulse 122.

He was put down for immediate operation for appendicitis, but on examining his chest a loud pleuritic rub was audible over right lower chest [illegible] therefore cancelled and patient transferred to the medical division.

Seen again at 10.45 p.m. of the same day, he was [illegible] the right iliac region and his abdominal wall had become [illegible] He had not slept.

Rectal examination showed great tenderness on the right s[illegible]

The signs in his chest were now evidently insufficient to [illegible] for the abdominal condition. He was accordingly taken to the theatre [illegible] anaesthesia (open ether) his abdomen was opened by a grid [illegible] The abdominal cavity contained much free greenish turbid fluid with flakes of [illegible] floating in it. The appendix did not appear to be much inflamed [illegible] removed. Its condition certainly could not account for the [illegible] trouble, so the abdomen was again opened by a right [illegible] the umbilicus. The omentum was found to be matted to the stomach and neighbour[illegible] protecting [illegible] wall of duodenum [illegible] closed with [illegible] reinforced by Lembert [illegible].

The [illegible] having [illegible] gauze rolls a drainage [illegible] placed in the right [illegible] another in the pelvis [illegible] made for [illegible].

Both [illegible] layers. [illegible] good recovery [illegible].

[illegible] to pleurisy or [illegible] the appendix [illegible] peritoneal cavity [illegible] of the [illegible].

[illegible]MENT OF HÆMORRHAGE BY COAGULEN [illegible]

By Surgeon Lieutenant R. W. [illegible] STEWART, O.B.E., M.B., D.P.H., R.N.

Case 1.—Admitted into hospital with a history of having coughed up about [illegible] bright red blood. The following day he had another hæmoptysis ([illegible] oz.). Cough was slight. Sputum nil.

During the next two days several severe attacks of hæmorrhage occurred in spite of the repeated administration of morphia hypodermically and other remedies. Coagulen Ciba [illegible] grs. in 300 c.c. water was then prescribed in ounce doses every two hours by the mouth. This was continued for forty-eight hours until the hæmoptysis had ceased and there was no further recrudescence. X-ray examination of chest was suggestive of tubercular infection of both lungs, most marked at the right apex. T.B. were never demonstrated in sputum. Patient had been under treatment about three months previous for a persistent cough which gradually ceased after a short holiday.

There was also a history of an attack of pleurisy about eighteen years ago when left chest was aspirated. No previous history of hæmoptysis. The physical signs pointed to a [illegible] case of old tuberculous trouble probably dating back to the attack of pleurisy.

Case 2.—This was a very severe case of hæmoptysis. Attacks of profuse hæmorrhage continued for several days. Patient was pale, anæmic and had lost weight considerably. There was a family history of pulmonary tuberculosis. Slight cough and very scanty sputum.

Morphia and ergotin were administered hypodermically but as the hæmoptysis persisted Coagulen Ciba [illegible] in 300 c.c. water was given in ounce doses two hourly by the mouth for twenty-four hours.

No further hæmoptysis occurred with the exception of one very slight attack. Physical signs in the chest were [illegible]. X-ray examination showed increased opacity at both apices, most marked on right side. Hilus shadows were definitely increased and there was considerable [illegible] over both lungs. No T.B. were found in the sputum [illegible] examinations.

Case 3.—This patient was admitted into hospital with a history of having had a severe fainting attack on the previous day about one hour after his midday meal. There was a history of discomfort after food extending over a prolonged period. This was aggravated during an attack of diarrhœa from which he suffered while serving [illegible].

On admission he was very pale and anæmic. Blood examination gave the following result: red cells 3,[illegible]00,000; white cells 11,000; hæmoglobin 35 per cent.; colour index 0·6.

During the next few days he passed large tarry stools and on two occasions there was evidence [illegible] haemorrhage. Pain was [illegible] the umbilical region. Coagulen [illegible] 200 c.c. water [illegible] three doses every two hours by [illegible] for two days. Tarry [illegible] passed for several days but no further [illegible] took place. [illegible] was very suggestive of duodenal [illegible].

Two weeks after [illegible] red blood cells had [illegible] nearly five millions per c.mm.

Some months later this patient was operated on for duodenal ulcer.

TWO CASES OF GLAUCOMA TREATED BY A MODIFIED [illegible]LLER'S OPERATION

By Surgeon Commander F. I. Atkinson, D.S.O., A.M., R.N.

Case 1.—W. H., aged 58, skilled labourer.

History.—The above was struck in left eye about 3 o'clock on October 31, 1925, causing a small wound of conjunctiva.

On Admission, November 9, 1925.—Left eye showed severe conjunctivitis, lacrymation and photophobia. Tension + + +. Vision R. 1—[illegible] 1 L. (partly).

Operation November 11, 1925.—Under cocaine (local) 3 minims of white vitreous were removed by acupuncture from the posterior chamber, the needle being at a tangent to the globe. The eye was then well covered with ung. hyd. ox. flav. and a pad and bandage applied. Patient was put to bed and remained there absolutely at rest, for three days. When the bandage was removed on November 14, 1925, patient was able to read [illegible] with the left eye. Tension normal. Some slight secondary congestion was present, probably due to the tension on the walls of the small vessels being relieved. On November 17, 1925, patient read [illegible] and declared that he had better sight now in the left eye than in the right, a clear indication of the success of the operation.

Case 2.—P. R., aged 45, skilled labourer.

History.—On October 23, 1925, above man injured his left eye whilst chipping concrete. One F.B. was removed and he returned to duty after attending for three days. On November 10 patient reported he was only able to [illegible] bright light with the left eye. Examination showed tension + + +.

Operation.—Under cocaine (local) three drops of whitish vitreous resembling the white of an egg were removed by acupuncture from the posterior chamber. The eye was then well covered with ung. hyd. ox. flav. and a pad and bandage applied. On November 14, when the bandage was removed, patient was able to read [illegible] with either eye and tension was normal. No secondary congestion was present in this case and after a further three days' rest patient was discharged to duty.

Abstracts.

[illegible] *Royal Army Medical Corps*, vol. xlv, No. [illegible] W[illegible] [illegible] R.A.F.M.S., has written a most [illegible] [illegible] Aerial Transport of Service Casualties which is worth [illegible] [illegible] all the fighting services. Transport by [illegible] [illegible] only on account of the saving [illegible] [illegible] regions of the world where rapid land transport [illegible] [illegible] found aerial transport invaluable in their operations [illegible] experience has thus been gained.

[illegible] for the Royal Air Force was a Vickers Vernon [illegible] 1920. It had accommodation for [illegible] [illegible] and came to an abrupt end by crashing [illegible] [illegible] planes were built with accommodation [illegible]. These ambulances did a considerable [illegible] from Kirkuk to Baghdad.

[illegible] ambulance was designed with accommo[illegible] [illegible] cases, and three are now in commission [illegible]

[illegible] troop carrier capable of carrying twenty-four passengers [illegible] folding back chair seats for twelve [illegible] sufficient floor space to take two extra stretchers if [illegible]

[illegible] been done by aerial transport, the author states [illegible] were transported from Serkhanna to Baghdad [illegible] hours forty-five minutes, the mileage covered [illegible]

[illegible] opinion that aerial ambulances should be of [illegible] in order that the pilots may be inter[illegible] always be used for evacuating odd [illegible] modified form of the naval Neil [illegible] be short and the patient likely to [illegible] is not suitable for a patient as he [illegible]

[illegible] Geneva Convention by using fighting [illegible] has not been overlooked and the author [illegible] proposals on this point.

G. O. M. D.

Surgical Notes

FRACTURES

[illegible] WARREN [illegible]

As [illegible] of fractures has incurred [illegible] ast on [illegible] on the conservative [illegible] action of the [illegible] Sir William I de Courcy [illegible] 1925) from which [illegible]

[illegible] more common, but [illegible] The common types are (1) [illegible] the pubic arch and [illegible] from the crest to [illegible] which the head [illegible] the floor of it into the pelvis [illegible] or [illegible] Treatment must [illegible] to the [illegible] injury to the soft parts

With regard to rupture of the bladder it is pointed out that [illegible] rupture of the [illegible] not [illegible] perhaps [illegible] The passage of [illegible] of fluid into the bladder [illegible] for the purpose of diagnosis [illegible] Stress is laid on a desire to pass [illegible] the catheter and the withdrawal [illegible] operating for this condition the [illegible] the rupture when closed should be [illegible] small piece of [illegible] drain passed to the point of [illegible] into the bladder With extraperitoneal rupture [illegible] piece of omentum is pulled through the line of [illegible] the sutures For an inaccessible rent suprapubic [illegible] may be necessary

When the urethra is ruptured a suprapubic incision into the bladder [illegible] that a catheter can be passed in retrograde fashion till [illegible] perineum This is cut down upon [illegible] rubber catheter is now passed [illegible] to that coming down from the bladder by a silk thread [illegible] can be drawn into the bladder and the urethra sutured [illegible] The perineal wound after a small drain has been inserted [illegible] partially closed while the silk thread on the bladder end of the catheter is retained [illegible] to pull a fresh catheter attached to the meatal end of the [illegible] into position after an interval of about five days

For maintaining the bones in position a girth or strong band is strapped tightly round the pelvis between the crest of the ilium and the great trochanter while both legs are [illegible] in Thomas's splints with flexion at the hips and knees to relax the muscles attached to the broken bones Rings are fixed to each side of the girth from which cords passing to pulleys are conducted to the head of the bed where the patient by grasping handles attached to them can help to raise himself for nursing purposes For dislocation of the head of the femur following fractures of the acetabulum extension is necessary after reduction in a Thomas's splint

Fractures of the neck of the femur are by no means uncommon in children [illegible]

[illegible] suspected [illegible] range is [illegible] some [illegible] occur.

[illegible] William Wheeler [illegible] inch of [illegible] and reduced [illegible] is crippling [illegible] result. Special stress [illegible] in full abduction. [illegible] to secure reduction of [illegible] by the author with [illegible] extension may be applied [illegible] by a plaster of Paris [illegible] splint may be used [illegible] Weight bearing is [illegible] painless and x-ray photo [illegible] stability [illegible].

[illegible] the great [illegible] is best treated in the abducted position, [illegible] the pathognomonic sign of which is inability to [illegible] position is controlled by a plaster spica with the thigh [illegible], the results are good.

Fractures [illegible] shaft. The opinion expressed by Mr. Russell, that the circumstance [illegible] operation in recent fractures of the shaft of [illegible] to the reposition of the fragments is considered [illegible] With [illegible] to the interposition of soft tissues between the ends of the bones it is stated that this is a matter of some difficulty as the muscles run parallel to the bones for the most part and their elasticity tends to make them disengage themselves; this force is brought into play to a greater degree when extension is applied. [illegible] anatomical replacement of the ends of the bones is [illegible] necessary, what must be prevented is angular deformity. [illegible] Application [illegible] stripping above the knee which has been advocated [illegible] stretching [illegible] ligaments of the knee joint is unnecessary because [illegible] extension are attached to the tibia and the ligaments of the knee joint [illegible] cannot be subject to stretching. To any [illegible] ligaments is quickly taken up during convalescence.

Fractures high up [illegible] shaft [illegible] treated by abduction and extension with [illegible] Thomas splint, the foot of the bed being raised. The [illegible] abducted to prevent tilting of the pelvis. Muscular [illegible] is of a temporary nature and tends to pass off when the leg is put up [illegible] In the lower third fractures of the femur where [illegible] backwards by the gastrocnemius reduction can be [illegible] extension [illegible] danger while a sling is used to prevent the [illegible] of the bone.

[illegible] upper third of the shaft has given good results when reduced [illegible] put up in abduction with continuous extension. In some [illegible] under the anaesthetic the proper length is [illegible]

[illegible] being taken by [illegible] p[illegible].

In [illegible] the leg to half a right angle [illegible] the deformity of the bone [illegible] children is [illegible] that, [illegible] not necessary to perfect functional recovery [illegible] operation is not advised.

Fractures about the lower end [illegible] the knee joint are amenable to extension on a Thomas [illegible] separation of the articular surfaces is an advantage [illegible].

Epiphyseal separation in which th[illegible] displaced forward is treated by strong flexion until the heel to [illegible] combined with traction on the tibia and direct manipulation [illegible] usually [illegible] is followed by shortening and interference with growth [illegible] this injury in full flexion the circulation of the limb below it should be carefully watched. If a metal tractor attached to the limb is required [illegible] reduction or transfixion pin passed through the bone is favoured [illegible] of the [illegible] is used in preference to transfixion of the femur [illegible] position for two or three months. When transfixion is used for [illegible] bones of the leg it is recommended to pass the pin through the os calcis [illegible] and behind the external malleolus in a downward and inward direction [illegible] traction produces inversion of the foot, rather than through the lower fragments above the malleoli.

Non and mal union.—The length of time given in the textbooks for strong union seldom errs on the safe side; each case varies and [illegible] not easy to draw the line between non union and delayed union. Before deciding that operation is necessary the percussion and dam[illegible] method [illegible] is advised. If this fails, bone grafting or a [illegible] is [illegible].

In cases of mal union manual refracture of the bones and extension [illegible] accomplished even after three or four months; at later periods an osteotomy is necessary with pin traction. It should be noted that late secondary displacement is liable to occur in fracture of the femur [illegible] even though the patients are kept in bed. There should be no interval between the removal of the extension and the application of a calliper splint which should be worn night and day. Two such cases are given: in one the displacement took place after [illegible] months, in the other after six weeks; neither patient had left his bed.

In connection with fracture of the patella the following points are mentioned: (1) in comminuted and longitudinal fractures conservative treatment is followed by bony union; (2) transverse fractures should be treated by operation, but good functional results may follow wide separation; (3) operation with bony union may not always give good functional results; (4) [illegible] the patella the knee joint may not be opened; (5) operation should not be performed unless under ideal conditions.

The first part of conservative treatment [illegible] effusion and Scudder's method of firmly applying two [illegible] after bandaging on is given.

The method of applying a horse shoe shaped piece of strapping which is connected to the foot-piece of a back splint, above the upper fragment, also figures. After these procedures full flexion of the knee should be restrained by an apparatus for some time. When an operation is performed the bone is not drilled, but the fragments are united by [illegible] wire passed through the insertions of the quadriceps and the ligamentum patellæ and encircling the bone. No splints are applied and the patient is allowed to make voluntary movements as far as he can do so without pain from the beginning.

Fractures of the tibia [illegible] are treated on the same principle as the similar lesion of the femur [illegible] the tibial spine with dislocation of [illegible] after reduction for two months [illegible] callus formation [illegible] should be removed after [illegible] of the joint [illegible] should be worn after the disappearance of [illegible] Robert Ollerenshaw [illegible] observations on thirty-two cases [illegible] that it is purely traumatic in origin [illegible] the patella of adults. D. Osgood [illegible] pathology.)

[illegible] upper third of the tibia is amenable to [illegible] lower third associated with fracture [illegible] It is not easy to reduce these cases [illegible] to apply strapping for extension [illegible] found satisfactory.

[illegible] Where reduction is easy and there is [illegible] the limb may be put up in [illegible] only with difficulty and tends to [illegible] Plaster is applied from [illegible] with the knee flexed and also below [illegible] have set the fracture is [illegible] the intervening space filled in [illegible] Achilles, in contact with [illegible] the fracture while plaster is [illegible] in such a manner as to [illegible] maintained on a Thomas's [illegible] the fragments being secured [illegible]

[illegible] lies in the immediate [illegible] backward displacement of the [illegible] is not likely to recur but [illegible] and an outside iron is useful [illegible] at least two months from the [illegible] properly reduced Pott's fracture [illegible] walk [illegible] the inner side of the knee. There is a tendency [illegible] and in late cases an osteotomy of the fibula is [illegible]

The principle [illegible] applied to fractures of the bones of the tarsus [illegible] be necessary to divide the tendo Achillis [illegible] Fractures of the os calcis often give rise [illegible] this is due to excessive bone formation [illegible] the os calcis he advocates wide removal of the [illegible] of the so-termed bones may give rise to symptoms [illegible] necessary to exclude the numerous accessory ossicles [illegible]

In conclusion [illegible] Sir William Wheeler pays tribute to Sir [illegible] as regards operative treatment as a step towards [illegible] application of conservative methods.

Medical Notes.

[illegible] BACTERIAL ENDOCARDITIS.

[illegible] W. [illegible] STEWART, O.[illegible] M[illegible]

This [illegible] considerable attention [illegible] of its [illegible] antecedent [illegible] has been reported [illegible] is probable that [illegible] position and [illegible] prolonged [illegible]

General [illegible] the rule [illegible] Mitral [illegible] rule the [illegible]

The [illegible] In a large [illegible] existing [illegible] especially of the [illegible] The infecting [illegible] in about 90 [illegible] of the cases. Th[illegible] found in cases [illegible]

Other [illegible] and influenza [illegible]

The illness [illegible] malaise [illegible] and loss of [illegible] limbs and [illegible] rheumatic character [illegible] sense (north [illegible] (4) Irregular [illegible] intervals. (Th[illegible] must be recorded [illegible] necessary [illegible] to take [illegible] to be normal [illegible] (5) Pallor [illegible] weight and clubbing of the fingers. The [illegible] special [illegible] (6) Enlargement [illegible] spleen. This [illegible] feel but should always be looked for. (7) [illegible] phenomena in (a) Skin. A petechial rash [illegible] below clavicles, around the neck, in axilla and [illegible] and palate. Osler's nodes at the end of the fingers [illegible] tenderness. They are exceedingly painful and [illegible] under the nail but there is nothing much to be seen except some [illegible] discoloration. (b) Kidneys. Hæmaturia results from glomerular nephritis. In [illegible] cases blood will be found in the urine at some time or other. (c) Spleen. This may be accompanied by very acute pain. (d) Limbs. The large vessels [illegible] frequently the seat of emboli causing aneurysmal dilatation. The [illegible] of the brain and mesentery may also be involved.

Cardiac symptoms are [illegible] absent [illegible] tachycardia and arrhythmia may occur. From [illegible] point of view the signs to be specially noted are pallor, clubbing of the fingers, enlargement of the spleen and embolic phenomena. Blood culture [illegible] of great importance, but it frequently happens that a negative result is returned. This [illegible] be due to several causes, viz. (1) the germ may only culture by [illegible] methods; (2) the valve or valves may be teeming with bacteria, but very few or none are circulating in the blood stream; (3) the valve and blood stream may have become bacteria free.

A positive result [illegible] be obtained by taking an arterial sample of blood.

Treatment.—This [illegible] on the general lines as for any case of septicæmia, but the p[illegible]ly grave.

Vaccines, anti-ser[illegible] have all been tried, but the results have not been encoura[illegible] should be made to isolate any micro-organisms which ma[illegible] blood, and if successful a vaccine should be prepared. In th[illegible] vaccine should be employed. If strepto-cocci are found ant[illegible] rum should be given subcutaneously in 10 c.c. doses daily for th[illegible] [illegible] by an interval of several days.

I have recently ha[illegible] this line of treatment undoubtedly brought about temporary i[illegible].

Practically all cases [illegible] which bacterial cultures have been positive have proved fatal.

Preventive Treatment.—[illegible] in combating sepsis generally (teeth, tonsils, ear, intestines, antra, sinuses, &c.) and more especially in persons who are the subjects of valvular heart disease.

Notes on Tropical Medicine

By Surgeon Rear-Admiral Sir P. W. BASSETT-SMITH,
K.C.B., C.M.G., F.R.C.P., L.R.C.S., R.N. (Retd.)

[illegible] Cook and the Australian Medical Harbingers. N. J. Dunlop. *Med. Journ. Australia.* 1925. September 19, vol. ii. No. 12. Pp. 362-373.

[illegible] is particularly drawn in this interesting account to the fact that [illegible] has been given to the medical officers Dr. Broughton Monkhouse [illegible] William Perry. In fact Dr. Hawkins in the *Australian Medical Gazette*, 1891 [illegible] that Captain Cook carried no surgeons. Unfortunately, the former died [illegible]. Before leaving England, by order of the Admiralty acting [illegible] of Dr. MacBride, a supply of malt was to be carried [illegible] to wort, as this might be of great benefit to seamen in [illegible] putrid diseases, and full records were to be made of its effects. [illegible] well ground, infused every day with boiling water for three [illegible] was to be then boiled and made into panado with biscuit. [illegible] was to be drunk, and the panado taken twice a day. For [illegible] mustard, vinegar, wheat, inspissated orange and lemon [illegible] soups and vegetables were used constantly or occasionally with [illegible] says that through their use the malt was but little [illegible] encouraged the quantity of salt pork and beef issued [illegible] the mixture of salt beef fat with their flour was forbidden [illegible].

[illegible] who were ill with or convalescent from, [illegible] a quart of the flour daily being given. The first [illegible] on the passage to Otaheite and were treated with the wort. [illegible] of them. He states that the wort was the best [illegible] the inspissated orange and lemon juice. In fact it is stated that MacBride's malt extract and infusion was a complete success in pre[illegible].

In a letter [illegible] it is interesting to note that for Captain Cook there was sent for the voyage by Dr. Fothergill: (1) Six gallons of lemon juice [illegible] Seven gallons of orange juice [illegible] gallon of [illegible] lemon juice and one of brandy. [illegible] lemon juice should when possible [illegible] bad.

[illegible] I know of the use of [illegible] would contain a certain amount of vitamin [illegible] time.)

Notes on Pathology

[illegible] L. BRISTOW, M.B., M.R.C.P. [illegible]

RECENT INVESTIGATIONS OF LEAD POISONING

In order to poison cats with lead by the gastro-intestinal route 50 mg. of [illegible] must be given three times weekly for several weeks by the stomach tube. Little lead is absorbed in the stomach and intestines and most of the lead absorbed is caught by the liver and excreted again in the bile. If [illegible] of lead are sprayed into the nose of a cat whose œsophagus has been tied to prevent the lead from being swallowed the cat can be poisoned within a day or two. Cats can also easily be poisoned by intratracheal insufflation of lead. Lead is readily absorbed by inhalation and is more likely to cause poisoning by the respiratory route because it is then carried to the tissues which it poisons without first having to pass through the liver which excretes lead. Measures to prevent lead poisoning should be chiefly directed to reducing the inhalation of lead fumes and dust by suitable ventilation, dust extractors and respirators, and by carrying out processes which give rise to dust and fumes in enclosed apparatus. Lead swallowed is comparatively unimportant.

After absorption lead circulates in the plasma and to a less extent in the red cells in the form of a colloidal suspension of tertiary lead phosphate. The red cells are rendered hard and brittle so that they break up readily when forced through narrow capillaries and the anæmia commonly seen in lead poisoning develops. This anæmia is associated with the appearance of basophilic granules in some of the red cells. This phenomenon is not specific for lead poisoning but represents an increased activity of the bone marrow, and is commonly met with in all forms of anæmia, especially in those where the products of red cell destruction are retained in the body.

The lead phosphate circulating in the plasma is deposited in the hard bones; in chronic cases of poisoning as much as 95 per cent. of the lead in the body is found in the bones. Acute poisoning may be caused either by rapid absorption into the body or by sudden liberation of large quantities of lead from the bones. The result of these is a general distribution of lead which is found *post mortem* in large quantities in all the organs of acute cases. Conditions which cause calcium phosphate to be deposited in or taken up from the bones have a like effect upon lead. Where calcium intake is greater than excretion both calcium and lead are deposited in the bones. When calcium excretion exceeds intake lead is taken up from the bones and excreted. A diet containing much calcium favours the deposition of lead in the bones whereas a diet low in calcium favours excretion. The well-known power of milk to prevent toxic symptoms in lead workers is probably due to its high calcium content which favours the deposition of the lead absorbed in the bones where, for the time being, the lead is harmless. Lead may be stored in the bones for many years without causing any symptoms and may then [illegible] too fast, may [illegible]

[illegible] at the normal [illegible] this state tend to [illegible] administration [illegible] chloride tend to [illegible] administration [illegible] effects on the [illegible] with magnesium [illegible]

[illegible] with a diet [illegible] more vulnerable [illegible] relieved [illegible] as little [illegible] 60 to 240 c.c. of [illegible] the ommon [illegible] 10 [illegible] exceeded [illegible] has [illegible] necessarily [illegible] This [illegible] largely based [illegible] Each of these papers [illegible]

[illegible] *Med.* [illegible]

Reviews.

[illegible] Surgery for Practitioners. [illegible] Rutherford Morison, Hon. [illegible] D.C.L., Hon. LL.D., M.B., F.R.C.S. (Edin. and Eng.), Consulting Surgeon, [illegible] Victoria Infirmary and Dental Hospital, Newcastle-on-Tyne; [illegible] Surgeon, War Pensions Hospital; Emeritus Professor of Surgery, Durham University. London: [illegible] Humphrey Milford, Oxford University Press [illegible]. Pp. x + 242, with nine illustrations. Price 8s. 6d.

This book [illegible] plea for the rehabilitation of the general practitioner [illegible] while the professional knowledge required of him [illegible]

[illegible] thinks, will regain the position held by his pre[illegible] the responsibilities which increasing knowledge has [illegible] should he know when the services of a specialist are [illegible] the victim of abdominal emergency depends [illegible] promptitude of his doctor, rather than on the ability of [illegible]

[illegible] as far as the abdomen and pelvis are concerned, no [illegible] than this little treatise. The abdominal states which [illegible] the intervention of a surgeon are divided into acute ailments and [illegible] clinical aspect of each is described, with numerous case histories which make the t[illegible] most [illegible] manner. Th[illegible] experience [illegible] special author[illegible]

The following [illegible] is [illegible] disturb[illegible] is delayed [illegible] stress being laid on [illegible] position, rectal [illegible] and the application of hot poultices. If [illegible] evacuated by operation in the continual [illegible] enterostomy under a local anaesthetic is necessary.

Attention is [illegible] to appendicitis due to [illegible] ushered in by a rigor. Severe pain repeated [illegible] signals.

Another rule of great importance [illegible] must be left without full exploratory operation [illegible] to the industry explorations [illegible] after the third [illegible]

This book will be most useful to those [illegible] diagno[illegible] the assistance of a laboratory or special dep[illegible] who be good [illegible] sea in ships will find it a pleasant and reliable guide. [illegible]

SCHISTOSOMIASIS VEL BILHARZIASIS. By C. C. [illegible] M.D. With [illegible] by [illegible] Christopherson, M.C., M.D. [illegible] Danielsson, Ltd. [illegible] Pp. [illegible]

This little book has been [illegible] a band of [illegible] for [illegible] experience of Natal and South Africa [illegible] characters of bilharzia [illegible] In Natal and probably [illegible] therefore the method [illegible] and also, as stated by Christopherson [illegible] ganda. From [illegible] meagre for [illegible] the author states [illegible] bined with a high [illegible] toxic [illegible] variable and this [illegible] The graph on page [illegible] methods than [illegible] many but [illegible] of antimony [illegible] latter [illegible] checking.

The book is easy reading [illegible] references are very [illegible] is from a public [illegible]. [illegible]

TOWARDS MORAL BANKRUPTCY. By Paul [illegible] With an Introduction by Mary Scharlieb, C.B.E., M.D., M.S. [illegible] Company. 1925. Pp. i—xvi + 546. Price 10/-

This is not a medical work, but the [illegible] journal depends on the fact that it is a book th[illegible] of the community would be well advised to read. For [illegible] a terrible indictment of the tendencies of contempo[illegible] supported by a mass of irrefutable and convincing evi[illegible] the conclusion that the people of France are rapidly [illegible] complete moral anarchy.

M. [illegible] attributes the present [illegible] causes [illegible] unbridled sexual licence [illegible] of [illegible] of which [illegible]. The bulk of the book is devoted to the [illegible] testimony collected to support [illegible] reveals [illegible] which were it not so firmly substantiated would [illegible].

The opening chapter deals with the [illegible] prevailing among the unmarried of both sexes [illegible] state of affairs fostered by the vast increase of prostitution [illegible] contraceptive practices, pornographic books and plays [illegible] ballets, together with the almost complete apathy of the [illegible] in regard to taking steps to repress these incentives to [illegible] with a tolerance of public opinion to all forms of viciousness. [illegible] tells us that it is by no means an uncommon occurrence for [illegible] the public stage before mixed audiences in a state of complete [illegible] depravity which was forbidden by law in Byzantium in the reign of [illegible] an age by no means celebrated for prudery.

The conduct of the married is next examined [illegible] results are equally depressing. We are presented with a terrible [illegible] almost universal practice of wilful sterility with the inevitable [illegible] abortion. Conjugal infidelity appears to be the rule rather than the exception, and the failure of ordinary contraceptive measures [illegible] astonishingly by abortion.

Obviously a nation which has strayed so far from the path of the Moral Law [illegible] endangering its very existence, and M. [illegible] gives convincing statistics showing the rapidly declining power of France with regard to its population, prosperity and industrial output.

The concluding portion of the book is an eloquent appeal to the people of France to extirpate the moral cancer which is corroding its vitals. The sincerity of this appeal, together with the robust religious principles [illegible] by the author, are the most inspiriting part of this terrible but fascinating work, which [illegible] closes with the firm conviction that unless his exhortations are speedily [illegible] his country will soon become a wilderness of vice and misery.

G. J. B.

The [illegible] of Tumours. By E. H. Kettle, M.D., B.S.Lond., Professor of Pathology and Bacteriology, Welsh National School of Medicine, Cardiff. London: H. K. Lewis, 1925. Second Edition. Pp. 283, with 1[illegible] illustrations. Price 12s. 6d.

The original plan of this book, to provide a manual for students which should [illegible] the generally accepted teaching on the pathology of tumours without the [illegible] proper to a more ambitious work of reference, has been kept in [illegible] the preparation of the second edition. A brief account of recent experimental [illegible] research has been included, and reference is made to the [illegible] work of Gye and Barnard. Additional illustrations have been [illegible] of the original photographs of naked eye specimens have been [illegible] bring out the characteristics of the growths better.

The illustrations in the first edition were good, but those in the present volume [illegible] being clear and easily understood without losing their resemblance [illegible]. The excellence of the photomicrographs makes tedious [illegible] histological appearances unnecessary, and the book is quite readable [illegible] book for anyone taking the F.R.C.S. or any other advanced [illegible] and is also handy for reference in the laboratory.

[illegible] into three parts. The first part deals with the aetiology [illegible] common characteristics of tumours in general. The [illegible] the different types of tumours, innocent and malignant

The [illegible] systems of [illegible] Alimentary S[illegible]. The [illegible] and the [illegible] [illegible]. The [illegible] small and [illegible] well p[illegible].

[illegible]

SURGICAL OPERATION[illegible] A [illegible] FOR NURSES. By [illegible] W [illegible] M D [illegible] B Sc, M S, F R C S, [illegible] Bristol General Hospital [illegible] Surgeon, Bristol [illegible] [illegible] Humphrey Milford, Oxford [illegible] Publications, 192[illegible] [illegible] Edition. Royal 8vo. Pp [illegible] ill[illegible] Price [illegible] net.

Those who realize the [illegible] thoroughly training a hospital [illegible] modern surgical technique [illegible] the second edition of this [illegible]. A surgeon, however brilliant [illegible] the operating theatre [illegible] reap his full reward unless [illegible] his orders know [illegible] such orders are given. Th[illegible] the [illegible] ment for operation [illegible] work is confined to the the[illegible] [illegible] lutes [illegible] tending the [illegible] through the simple or complex [illegible] which follow must possess the [illegible] knowledge which this book [illegible]. Blind faith with [illegible] judgment cannot justify [illegible] surgical atmosphere.

Mr Hey Groves has [illegible] all the most important [illegible] [illegible] part [illegible] problem but [illegible] the [illegible] the book. [illegible] could not be improved upon [illegible] Murray's opera[illegible] [illegible] [illegible] appendix [illegible] [illegible] of [illegible] we would suggest the [illegible] [illegible] [illegible] be described more clearly. [illegible] surgical [illegible] the method [illegible] [illegible] positions. The appendix [illegible] [illegible] alphabetically [illegible] in the text.

This textbook [illegible] literature in the [illegible] in simple language [illegible] We cannot recommend it too highly to anyone who [illegible] a surgical patient [illegible] [illegible]

H L R S

THE ADVANCE OF ORTHOPAEDIC S[illegible]. By A H Tubby, C B, C M G, M S, F R C S, Consulting Surgeon to the [illegible] National Orthopaedic Hospital, &c. Illustrated. Reprinted [illegible] Journal. Pp xii + 181. London: H K Lewis and Co [illegible] 7s 6d net.

In this small book Mr Tubby [illegible] resumé of the recent advances in Orthopaedic Surgery, and [illegible] one may be certain that only well established and [illegible] will be described.

In the older [illegible] diseases, a [illegible] of the lumbar vertebrae, Osgood-Schlatter's [illegible] Kohler's disease, diseases of the epiphyses and the recognition of the [illegible] nerve elements in a mixed nerve [illegible] the [illegible] operations of muscle implantation [illegible].

Mr Tubby has [illegible] to collate the newly acquired knowledge in [illegible] unnecessary detail [illegible] [illegible] the surgeon [illegible]. [illegible] [illegible] the [illegible] the different operations [illegible] each chapter. This is a [illegible] valuable book which shows [illegible] either congenital or acquired deformities [illegible] practitioner. J R M [illegible] JOURNAL [illegible] (1912) [illegible] Strand W.C. [illegible] net

[illegible] first number of which [illegible] will [illegible] post-graduate courses [illegible] through the [illegible] of Medicine [illegible] The [illegible] evident [illegible] general [illegible] towards an [illegible] teaching.

[illegible] relating [illegible] and [illegible] the [illegible] Medicine and [illegible] and Sir [illegible] post-graduate [illegible] Rolleston, and [illegible] The [illegible] Sir Thomas Horder [illegible] interest to the naval [illegible] Physical Signs [illegible] their diagnosis.

[illegible] at which families [illegible] and teachers [illegible] the journal are [illegible] branches of medicine [illegible]

[illegible] especially to [illegible] in our best [illegible]

The [illegible] T. B. S.

THE BRITISH JOURNAL OF VENEREAL DISEASES [illegible] 1925. Vol. I. No. 4.

[illegible] preparation of silver [illegible] and [illegible] gelatine sown with [illegible] power of penetration than [illegible] in favour of silver [illegible]

[illegible] by Mr. A. C. Hudson [illegible] C. Bousans at the meeting of [illegible] the Study of Venereal [illegible] on March 27, 1925, deal with [illegible] syphilitic affections of the eye. The discussion which followed is also reported.

Mr. [illegible] Walker contributes a preliminary note on a simplified [illegible] test. This modification appears to offer no advantages over that of Webb.

The relation of venereal disease to industry is discussed by W. M. Bruant.

Naval medical officers should notify retiring or [illegible] sick berth staff ratings that the Editors publish a list of ex-service men who desire employment in civil [illegible]. Ratings should submit direct to the Editors their names and addresses, together with details embracing their experience in V.D. work, the wages they expect, and any other qualifications such as typewriting, staining of specimens, &c.

This number of the *British Journal of Venereal Diseases* maintains the high [illegible] its predecessors. All medical officers interested in venereal work will find the modest annual subscription of 20s. a paying investment. R. J. G. P.

A [illegible] Committee [illegible] [illegible] Electronic Reactions of Abrams [illegible] [illegible] [illegible] Thomas Horder [illegible] Heald, C.B.E., M.D. [illegible] F.R.C.P. [illegible] M.C., A.M.I.E.E. [illegible] Whitehead, M.Sc. London [illegible] 1925 Price 2s. 6d.

This investigation was undertaken at the [illegible] Medical Adviser to the Director of Civil [illegible] the matter on the grounds that if [illegible] the Air [illegible] school were to be established [illegible] uniquely convenient method of keeping [illegible] fitness of civil pilots. The aid of the [illegible] became apparent that much specialized [illegible] medical practice might be necessary [illegible] concerned. The author deplores the [illegible] assailed by previous critics, which [illegible] forward the most startling claims on the [illegible] evaded their conclusions that he expressed [illegible] charlatanry and that he had no [illegible] charges apparatus crudely constructed [illegible] maintained however that Dr. Abrams [illegible] covery of genuine scientific importance [illegible] almost for immediate advantage in [illegible] laborious and financially unprofitable [illegible] diagnostic technique and of Dr. Boyd's [illegible] the use of a subject or medium [illegible] on earthed plates facing west the [illegible] abdominal wall when tested in relation to the specimen [illegible] are interpreted in terms of pathological or other character [illegible] whom the specimen was obtained.

Experiments were carried out in connection with [illegible] Dr. Boyd. Although the writer condemns the methods of [illegible] previous investigators it appears that the Committee [illegible] themselves. It is stated that the [illegible] as follows:—At Glasgow Dr. Boyd was given six specimens in [illegible] placed in different envelopes (numbered according [illegible] and was told that these specimens constituted three pairs [illegible] taken from Dr. Heald and another from Dr. C. H. S. [illegible] the third pair was blank. The problem was to [illegible] This the demonstrator successfully achieved and [illegible] reactions given by these specimens with those [illegible] correctly stated which pair was from Dr. Heald and which [illegible]

Numerous other experiments were carried out with varying [illegible] result of which the Committee consider that the following [illegible] justified:—

(1) That certain substances when placed in proper relation to the [illegible] of Boyd produce beyond any reasonable doubt, changes in the abdominal wall [illegible] the "subject" of a kind which may be detected by percussion. This [illegible] amount to the statement that the fundamental proposition underlying [illegible] the original and certain other forms of apparatus devised for the [illegible] eliciting the so-called Electronic Reactions of Abrams is established to a very high degree of probability.

[illegible] of them [illegible] himself.

(3) [illegible] and highly susceptible to [illegible] is necessary to take [illegible] culmination of effect [illegible]

(4) [illegible] to hazard in the [illegible] hypotheses [illegible] basis of the phenomena [illegible]

[illegible] the writer [illegible] is taken much [illegible] either the explanation [illegible] the facts recorded [illegible] the application [illegible] in the field of [illegible]

W. H. B.

[illegible] With a Report on [illegible] Cases. By [illegible] Introduction [illegible] M.D. Dub. [illegible] London: W. [illegible] Medical Books) Ltd. [illegible]

[illegible] has formed [illegible] legends [illegible] men have turned [illegible] the treasure of their [illegible] Jason perseeing [illegible] with the object of [illegible] Dr. Faustus's pact [illegible] the blank verse of [illegible] Goethe, and again [illegible] account of the [illegible] Florida in hopes of [illegible] to exist in that [illegible] evidence that the [illegible] presented [illegible] capable of realiza[illegible] although [illegible] those of [illegible] are less [illegible] Dr. [illegible] first part of the [illegible] consider and [illegible] Steinach's [illegible] his [illegible] The operation [illegible] to remark is [illegible] that of Voronoff [illegible] planted [illegible] employs [illegible] renews [illegible] increased [illegible] of the sexual [illegible] changed [illegible] reach the blood [illegible] impulse [illegible] towards revitation [illegible] the generative [illegible] hormone; this is [illegible] tissues. [illegible] have no [illegible] the mental [illegible] characters.

[illegible] Steinach [illegible] the percentage of [illegible] from Steinach's [illegible] performed upon such [illegible] to the conclusions [illegible] justifications [illegible]

[illegible] criticism [illegible] operation, as it has [illegible] that its primary [illegible] increase sexual [illegible] states that his chief [illegible] this book is to [illegible] feeling, and that the [illegible] of the operation is general [illegible] from the *vita sexualis*. Unfortunately the statements of the [illegible] successfully treated by this method which are recorded in this [illegible] hardly as [illegible] the autho[illegible] glory chiefly in their renewed [illegible]al pr[illegible]

We recommend this litt[illegible] those [illegible] the subject N[illegible] fantastic results are claimed [illegible] I with equal impartiality C L B

SWANZY'S HANDBOOK OF THE D[illegible] TREATMENT Thirteenth Edition [illegible] W[illegible] M D, F R C S I London H K Lewis and Co Ltd [illegible] Price 21s net

Those familiar with the [illegible] new edition which although completely revised and subj[illegible] and additions besides being brought up to date in every [illegible] size by twenty pages thus avoiding the unpleasant [illegible] other textbooks which tend to increase alarmingly [illegible] edition is issued

Chapter VII, on Diseases of [illegible] Body, has been partly rewritten and considerably [illegible] applies to the description of the Diseases of the Chor[illegible] to Chapter XII

The chapter on [illegible] has always been such a valuable asset in this book is practically [illegible] for the excellent reason that it could hardly be improved [illegible] its character by considerable enlargement—an unnecessary [illegible] information supplied aided by the accompanying lucid explanat[illegible] to enable the beginner to overcome the optical problems [illegible] refractions &c

The description in Chapter XVII on [illegible] due to want of normal equilibrium of the orbital muscle[illegible] side of gravity is most valuable, especially to the [illegible] candidates in regard to their fitness for flying duties The diagrams [illegible] of the various forms of heterophoria are of great help in making [illegible] subject quite clear

The coloured plates are up [illegible] excellent

Appendix I—which gives in detail [illegible] candidates for admission to the Naval Military [illegible] Royal Irish Constabulary, Pilot Service and Mercantile Marine [illegible] assistance to the practitioner who is consulted con[illegible] those services

Swanzy's Diseases of the Eye [illegible] is one of the best textbooks on the subject, no eulogy [illegible] excellence The new edition sustains in every [illegible] the past combined with the most recent developments o[illegible] C L B

News of the Service.

OBITUARY

[illegible] he had [illegible] he [illegible] was appointed [illegible] Lord [illegible] eight [illegible]

[illegible]

Our [illegible] also devoted [illegible]

To Mrs. [illegible] and [illegible] most sincere sympathy [illegible] because [illegible]

We regret to announce the death of [illegible] (retired) which took place in [illegible] Hospital [illegible]

Born in 1853 the youngest [illegible] educated at the Queen's [illegible] a surgeon in the same year.

In 1882 while serving in H.M.S. [illegible] was in action with the Naval B[illegible] Commanding Officer reported [illegible] bluejackets and Marines [illegible]

He was promoted to Staff Surgeon [illegible] the sick quarters at Esquimalt [illegible] of [illegible] and his [illegible]

He was promoted to Fleet Surgeon [illegible] the latter [illegible] he served at Haslar [illegible] placed in charge of the R.N. Hospital [illegible] Lordship's appreciation of the [illegible] carried out.

He was made an Honorary Physician [illegible] consequence.

At the outbreak of the war he [illegible] being Commandant at Queen Mary's [illegible] Hospital at Roehampton [illegible] Sir Mortimer Singer's Hospital [illegible] undertake the duty in order to set free a younger man.

An able medical officer and [illegible] characteristic [illegible] his unobtrusive kindness [illegible] Service.

It is impossible to [illegible] character but the value of [illegible] example [illegible] considerate [illegible] to be seen [illegible]

In the painful illness [illegible] qualities which had [illegible] throughout his career [illegible] among [illegible] truly be said:—

[illegible]

The death on October 4, 19[illegible] Deputy Inspector-General William Williams.

He was born in 1845 [illegible] 1870 and joined the Royal Navy as Surgeon in 18[illegible] He was promoted Staff Surgeon [illegible] Fleet Surgeon in 1888.

He had an excellent record throughout his Service [illegible] 1892 was granted the rank of Deputy Inspector-General.

[illegible]

[illegible] death [illegible] Hospital [illegible] Harvey [illegible] Surgeon [illegible] [illegible]

HONOURS

[illegible] pleased to make the following [illegible]

[illegible] (Military Division) — [illegible] Joseph [illegible] (Medical Director General of the Navy) [illegible]

[illegible] graciously pleased to approve [illegible] Surgeon [illegible] R.N. Hospital, Chatham [illegible] of the late Surgeon General [illegible]

His Majesty the King has been graciously pleased to approve [illegible] Surgeon Rear-Admiral [illegible] R.N. Hospital [illegible] in the vacancy caused by the death of the late Surgeon General [illegible] November [illegible]

The King has been graciously pleased [illegible] occasion of [illegible] H.R.H. [illegible] to give orders for the following appointments to the [illegible] Order [illegible] (to be dated October [illegible]) —

[illegible] of the said Most Excellent Order [illegible] Commander [illegible] White, M.V.O., M.B., F.R.C.S. [illegible]

DEGREES AND DIPLOMAS

[illegible] Commander W. [illegible] M.D. [illegible] Membership of the Royal College of Physicians (London) [illegible]

PROMOTIONS

Surgeon Commander R. W. B. Hall, O.B.E., promoted to Surgeon Captain [illegible] December 31, 1925 [illegible]

Surgeon Lieutenant-Commanders C. S. Harvey, M.B., W. H. Morris and C. H. [illegible], M.B., promoted to Surgeon Commander [illegible]

Surgeon Commander [illegible] D. Rutherford, M.B. (retired list), promoted to Surgeon Captain (retired) [illegible]

R.N.V.R. Surgeon Lieutenant-Commander A. [illegible] W. Hunt promoted to Surgeon Commander [illegible]

APPOINTMENTS

[illegible]

[illegible] Commander W. G. [illegible] M.D., to *President* (and for special duties). Surgeon [illegible] R.N. Hospital, South [illegible] Surgeon Lieutenant-Commander [illegible] (with for specialist duties).

October

[illegible] W. G. Edwards, M.D., to [illegible] (and as Squadron M.O.). Surgeon [illegible] Surgeon Commander T. A. Smith, M.B., to R.N. [illegible] Surgeon Commander [illegible] D.S.O., to R.N. Sick Quarters [illegible] Surgeon Commander M. C. [illegible] to R.N. Hospital, Chatham [illegible] Surgeon Commander [illegible] O.B.E., M.D., to [illegible] Surgeon [illegible] School [illegible] Surgeon Commander [illegible] Surgeon Lieutenant A. H. Joy to [illegible] Surgeon [illegible] Surgeon Lieutenant-Commander L. [illegible] Surgeon Lieutenant [illegible] Surgeon Lieutenant [illegible] M.B., to [illegible] Surgeon Lieutenant [illegible] M.B., to [illegible] Surgeon Lieutenant [illegible] Bernstein [illegible] W. T. [illegible] to *Royal Oak*. Surgeon Lieutenant (D) J. [illegible] (and [illegible])

[illegible] Lieutenant-Commander [illegible] W. [illegible] Moore, M.B. M.A. [illegible] Excellent [illegible] A. W. [illegible] M.B. [illegible] J. A. W. [illegible] R.N. Hospital [illegible] R.N. [illegible]

[illegible] Commander F. M. [illegible] J. W. [illegible]

RETIREMENTS

Surgeon Captain H. S. B[illegible] C.M.G., M.B., placed on [illegible] regulations [illegible] 16, 1925, with rank of Surgeon Rear-Admiral.

Surgeon Commander W. J. Co[illegible] O.B.E., M.B., F.R.[illegible] of age regulations, October 14, 1925, with rank of Surgeon Captain.

Surgeon Commander C. R. Richard[illegible] placed on retired [illegible] October [illegible] with rank of Surgeon Captain.

Surgeon Commander John Whelan placed on retired list [illegible]

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

Miss Marjorie Florence Cheetham entered as Nursing Sister, November 14, 1925.

APPOINTMENTS.

Miss E. Bickel[illegible] to R.N. Hospital, Haslar, dated October 30, 1925.

Miss M. F. Cheetham to R.N. Hospital, Haslar, dated November 14, 1925 (in [illegible] six months).

Miss B. M. Martin, A.R.R.C., to R.N. Sick Quarters, [illegible] dated November 13, 19[illegible]

RETIREMENT.

Miss Mabel Hereford placed on retired list, November 11, 1925, after having served [illegible] twenty-three years.

The following Members of Queen Alexandra's Royal Naval Nursing Service attended the Funeral [illegible] Her Majesty Queen Alexandra at Westminster Abbey [illegible] November 27, 1925:

Head Sister Miss Margaret [illegible] R.R.C., and Nursing Sister Miss [illegible] (Chatham).

Superintending Sister Miss [illegible] and Nursing Sister Miss [illegible] A.R.R.C. (Haslar).

Nursing Sisters Miss [illegible] and Miss M. C. [illegible] (Plymouth).

The following message was sent to His Majesty the King:

The Members of the Queen Alexandra's Royal Naval Nursing Service beg Your Majesty's acceptance of sincere sympathy and sorrow at the death of Your Mother, our beloved President.

A [illegible] wreath composed of [illegible] was subscribed for by the Members of Queen Alexandra's Royal Naval Nursing Service and [illegible] Windsor [illegible] November 2[illegible]

The [illegible] card was [illegible] as follows:

In revered and respectful memory of our Beloved President, from the Members of Queen Alexandra's Royal Naval Nursing Service.

ADMIRALTY FLEET ORDERS

***3677 Surgeon Lieutenants R.N. for Short Service. Duration of Engagement for Short Service.**

(C.W. [illegible])

Surgeon Lieutenants R.N. entered for Short Service [illegible] [illegible] are required to [illegible] whether they desire to [illegible] months after the termination of their [illegible] for Short Service.

Surgeon Lieutenants R.N. for Short Service who have completed [illegible] [illegible] of the receipt of this order [illegible] [illegible].

3839.—Medical Stores. Supply in addition to those allowed by Scale.

(M.D.G. 8397/25.—9.10.1925.)

When medicines, &c., are required in addition to those allowed by the Scale of Medical [illegible] for the Service Afloat, Medical Officers of seagoing vessels are to furnish reasons [illegible] [illegible] such articles.

The established scale is to be adhered to as far as practicable, and consideration will only be [illegible] where reasons given are adequate.

[illegible] should be [illegible] to R.N. Hospitals [illegible] the usual means [illegible] [illegible].

3984.—Medical Libraries for the Service Afloat.

(M.D.G. 8827/25.—16.10.1925.)

[illegible] the undermentioned books are now available [illegible] from the Royal Naval [illegible] Haslar, Chatham and Plymouth:—

[illegible] and Treatment of Venereal Diseases (Harrison) (in lieu of [illegible] Manual of [illegible]).

[illegible] (Manson 1921).

[illegible] Blood Work and [illegible] (Smith) (in lieu of [illegible] and [illegible] Work.)

[illegible] H.M. Ships should [illegible] [illegible] of the [illegible] [illegible].

3141. Vaccination of Personnel Proceeding to the Mediterranean.

(N. 4612/25.—6.11.1925.)

[illegible] proceeding to the Mediterranean Station [illegible] to be re-vaccinated [illegible] [illegible] vaccinated within the last five years.

(Drafting Regulations, Articles 10 and 41.)

(K.R. and A.I., Article [illegible].)

(A.F.O. 2204/25 is cancelled.)

3142.—Dental Fitness for Duty at Isolated Stations Abroad.

(M.D.G. [illegible]/25.—[illegible].11.1925.)

[illegible] drawn to the need for a high standard of dental fitness in Officers [illegible] [illegible] duty at isolated stations abroad, e.g., W/T Station, Christmas [illegible] [illegible] the difficulty of obtaining the services of Dental Surgeons [illegible] [illegible] [illegible] dental disease before being passed as fit [illegible] [illegible] Officers [illegible] advised to obtain [illegible] [illegible] before leaving England.

(K.R. and A.I., Article [illegible].)

(Drafting Regulations, Article [illegible].)

3146.—Notation of Discharge from the Service on Medical History Sheets.

(M.D.G. [illegible]/25.—6.11.1925.)

It frequently happens that particulars of the date and cause of discharge are not noted [illegible] Medical History Sheets forwarded to the Medical Director-General. Medical Officers are [illegible] to ensure that such particulars are always carefully inserted on the Medical History Sheet of ratings on discharge from the Service. A notification that the Medical History Sheet was forwarded to the Medical Director-General on a certain date will not suffice.

In addition, the particulars required by C.A.F.O. 1990/24 are to be inserted on Medical History Sheets.

(C.A.F.O. 1990/24.)

3162 R N V R Regulations—Amendments

(R I D —[illegible])

Article 129

Medical and Dental Branch

[illegible] Surgeon Lieutenant-Commander [illegible] when Officers have [illegible] provided [illegible] Surgeon Commander will be [illegible] Surgeon Captain will be [illegible]

(C W [illegible] N R [illegible])

3269 —Naval Ratings of the Fleet Air Arm whose Duties take them into the Air—Medical Examination

(N [illegible] 20 11 1925)

Naval ratings of the Fleet Air Arm whose [illegible] take them into the air [illegible] medically examined in accordance with [illegible] A — B — C and D [illegible] paragraph 4 of A F O [illegible] 24 except that eye movement co-ordination (sub paragraph D (v) Heterophoria) [illegible] not required so far [illegible]

At present the only ratings whose duties take them [illegible] are Telegraphist ratings. The medical examination of all future volunteers for this duty are to be carried out at [illegible] R N Hospitals as necessary.

(A F O 1095 24)

3313 —Anti-Typhoid Vaccine Date Available

(M D G [illegible] 25 —27 11 1925)

Arrangements have now been made [illegible] the Anti-Typhoid Vaccine [illegible] the [illegible] of the Atlantic Fleet will be available for use during the [illegible]

2 Medical Officers [illegible] the first opportunity [illegible] vaccine from R N Hospital [illegible] that effective protection [illegible] the [illegible] Spring Cruise

3340 Form B 71 —Revision

(S [illegible] 86/25 27 11 1925)

Form B 71 Medical [illegible] has been revised and B 71a Medical [illegible] incorporated therein but the old forms are to continue in use and will be [illegible] stocks exhausted

3367 —Death Reports to Medical Director-General

(M D G [illegible] —1 12 1925)

Reports of the deaths of all Officers and men accompanied by Medical History Sheets [illegible] forwarded to the Medical Director-General as early as practicable [illegible] Naval Hospital abroad [illegible] civil hospital [illegible] In the case of death at a Naval hospital at home a report will not be required. The report should contain [illegible] the case [illegible] opinion should be expressed [illegible] whether the [illegible] death is [illegible] to the conditions of the Service.

2 When death occurs at a Naval Hospital abroad [illegible] Medical History Sheet [illegible] should be forwarded [illegible] the report. If however the death occurs [illegible] hospital [illegible] should be obtained from the hospital and forwarded with the report.

3 [illegible] reports referred to [illegible] by the Medical Officer and forwarded through the Commanding Officer

Notices.

The [illegible] Officers to se[illegible] [illegible] personal experiences. [illegible] Items of [illegible] the Naval Medical Service will be welcomed [illegible] home and foreign stations

All Articles [illegible] published in the Journal of the Royal Naval Me[illegible] will become the property of the Journal with full copyright [illegible] the author declares when sending the Article that he de[illegible] the copyright to himself.

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All Communications should reach the Editors on or before the 1st of the month preceding the date of issue Unless clearly written they should be typed in order to avoid mistakes and they should be addressed to the Editors Journal of the Royal Naval Medical Service, Medical Department Admiralty London

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All applications for [illegible] to be made to
[illegible] ALEXANDER & CO 31 Craven Street London, W.C.

Vol. XII. April, 1926. No. 2

Journal of the Royal Naval Medical Service.

Original Articles.

THE TECHNIQUE AND CLINICAL INTERPRETATION OF THE FRACTIONAL METHOD OF GASTRIC ANALYSIS

Surgeon Commander LESLIE M. MORRIS, O.B.E., R.N.

AMONGST the clinical function tests introduced in recent years that of the Fractional Test Meal has been proved by experience to be of great benefit to the clinician, as it gives information which could not be obtained by the older method of examination of the gastric contents at one period of one hour only after giving the test meal.

By the introduction of the method of Rehfuss in 1914 it is now possible to examine the content of the fasting stomach and to follow the gastric function at half hourly intervals for a period of three and a half hours or more without unduly distressing the patient. The modified Ryle's tube is easily swallowed and retained, whereas the passage of the larger stomach tube often caused considerable discomfort.

The clinical experience with this test has been gained in the examination of seventy cases from the medical and surgical wards of Haslar Hospital, and also in the Medical Unit of St. Bartholomew's Hospital. The findings are based on recently published works by Ryle [1], Bolton [2], Bennett [3], Hunter [4], Hurst [5], Bonar [6], Emerson [7], Beaumont and Dodds [8].

A study of these papers leaves no doubt as to the diagnostic value of the test, and to the large amount of important detail that can be deduced from both the clinical aspect of the procedure as well as in the laboratory where the chemical part of the examination is performed.

The main indications for the test are to determine the motility rate of the stomach in response to the test meal, to test the pyloric function and to ascertain if there is any delay or obstruction. This examination, when combined with the clinical condition and *x*-ray report offers valuable additional evidence and should always be one of the investigations to be carried out in suspected cases of gastric pyloric or duodenal ulcer many cases of this last condition giving diagnostic findings.

Much help is given in the early diagnosis of carcinoma of the stomach [3], also in any organic or functional cause which is affecting the action of the pylorus or causing stenosis

Other diseases, such as Addison's anaemia [5] and obstructions around or about the gall bladder, give results which often confirm the clinical diagnosis

The most definite cases are those in which there is pyloric obstruction or reflex stenosis these cases are surgical in nature and the evidence given in this test is of great help to the surgeon when the question arises as to performing gastro-enterostomy

The test is again valuable after the operation has been performed as it shows evidence of the functioning power of the stoma of the motility rate and the acidity curve in the altered physiological and anatomical conditions

Bouar [6] gives a full account of these findings in an article entitled Gastric Function before and after Gastro jejunostomy" Ryle [1] in the Goulstonian Lectures states that "In the light of modern experience it seems fair to insist that no gastric surgery other than urgent surgery should be undertaken for the relief of symptoms due to an active ulcer without a preliminary fractional gastric analysis as well as a radiographic examination

He also asserts that Motility (or emptying-rate) and the factors disturbing it are more completely and accurately studied with the gastric tube than by other methods.

Emerson [7] states that ' Undoubtedly the work of Rehfuss and his co workers is one of the great advances in clinical medicine A report on any given case includes (1) the quantity and character of the resting fluid Bennett [4] has emphasized that it is by the character of the resting fluid that carcinoma can be recognized (2) The emptying rate of the stomach (3) The physical character of the samples, entry of bile or the presence of blood or mucus (4) The curve of acid secretion and neutralization (5) The conclusions derived from the combined findings

Technical Methods.

Preparation of the patient —The less preparation the better for it is required to find the condition of gastric function apart from any previous treatment such as the administration of large doses of acids or alkalies in cases of dyspepsia

The patient is given an ordinary light evening meal but nothing after 9 *p m* If carcinoma or gross obstruction is suspected then two teaspoons of finely divided charcoal or two charcoal biscuits, should be given at [illegible] in a glass of milk The finding of the [illegible] resting fluid the next morning suggests delay and is [illegible] obstruction at the pylorus

The patient is kept in bed for the test and [illegible] the tube has been swallowed is encouraged to read

A Ryle's (modified Rehfuss) tube is a thin flexible rubber tube having a thin bulbous extremity weighted with metal there are four perforations just above the extremity and three marks situated at 19 in, 21 in and 26½ in

The tube is swallowed by taking it in with the lips and by a deep swallowing movement when the extremity reaches the pharynx Nasal breathing aids the success of this and there is little discomfort if the method is carefully explained beforehand

Many patients prefer to drop the end of the tube into the open mouth with the head held well back and to swallow it like a pill When the mark at 21 in reaches the lips the patient is told to cease all movements and is allowed to get used to the feel of the tube in position he is encouraged not to swallow large amounts of saliva nor to cough

With a 20 c c syringe, the *whole* of the resting fluid in the stomach is carefully drawn off measured and kept for examination in a test tube It is important to evacuate all the resting fluid in order that the following samples may fully represent the condition as starting from the empty stomach

There is no necessity to strain the samples through muslin as the unstrained samples show a better indication of the physical characters—such as the amount of residue, the presence of blood bile or mucus and the nature of deposits

A little air pressure in the tube will always clear a temporary blockage

The meal is then given when the tube is in the stomach and consists of 2 oz of fine oatmeal (salt free) in a quart of water—boiled down to 1 pint and strained through coarse muslin in order to remove the larger particles

This pint is taken slowly, and the patient kept quiet in the sitting position the end of the tube being fixed to his clothing near the shoulder

Samples of from 15-20 c c are gently drawn off every half hour up to three and a half hours When the stomach is nearly empty it is often difficult to obtain more than a few c c

The samples are placed in a series of test tubes and it is at this stage that the person taking off the samples is able to gain a lot of information such as the ease with which the fluid is obtained the amount of food residue and the presence of bile blood or mucus The physical characters of the contents of the syringe give important data which will be detailed later in the laboratory The test is essentially a clinical investigation, almost as much can be learnt from the manner in which the specimens are withdrawn and their naked-eye appearance as from the quantitative [illegible] withdrawn after the last [illegible]

[illegible] —The emptying rate is [illegible] quantity of the [illegible] giving the [illegible] time of emptying [illegible] converted to sugar then the absence of both starch [illegible] the time of emptying

The [illegible] on the special chart of the report

The [illegible] or mucus is noted also the finding of [illegible] coffee grounds

Each [illegible] for free HCl and total acidity as follows Take [illegible] in a small beaker and add a few drops of a 0.5 per cent [illegible] indicator in 90 per cent alcohol A rose pink colour denotes the presence of free HCl If there is no free HCl present then the colour becomes yellow

If free HCl is present titrate with a decinormal solution of sodium hydrate from a burette until the sample assumes a clear yellow colour this quantity, multiplied by twenty, gives the percentage of free HCl To estimate the total acidity, go on adding the soda solution to the same sample until a permanent blue colour appears the final reading multiplied by twenty being the total acidity (T A) percentage

These figures are produced in the form of a curve the difference between the curves being usually 10 to 20 per cent

The total chlorides and inorganic chlorides may also be determined in certain cases such as Addison's anaemia and carcinoma

The resting fluid (R F) may be tested for occult blood also for presence of smell and evidence of obstruction The amount should be noted as well as its general appearance

The R F is relatively the most important specimen as it gives certain evidence of the state of the fasting stomach

The time of bile entry and the amount in the various samples give important information as to the function of the pylorus and the presence or otherwise of the normal flow of duodenal fluids into the stomach In some cases of pyloric spasm bile enters once only and is rapidly ejected Bile, when present in an acid fluid assumes a characteristic green colour

The presence of blood should be looked for at the time when the stomach has recently emptied and the content again becoming stationary Excess mucus always suggests gastritis

The curves of acid secretion and alkaline neutralization will be seen to be governed by the pathological condition at the time the curve of neutralization is generally of more importance than that of acid secretion

The final part of the examination report should state the conclusions arrived at as the result of the whole test

Chart I shows the main characters of the normal iso secretory curve, or one that does not show any evidence of derangement of function There is however, considerable variation in healthy persons

The emptying rate to this standard test meal is complete in about one and three-quarter hours Bile enters at two or two and a half hours No excess mucus

The R.F is clear and contains a little mucus sometimes a small amount of bile The total amount is very variable and depends on the nature of the diet usually from 10 up to 50 *c c*, but often less The presence of over 100 *c c* suggests delay and dilatation Free HCl is 0 per cent T A 10 to 20 per cent No odour or dirty colour

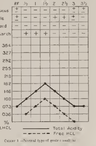

CHART 1 —Normal type of gastric analysis

The oatmeal is seen in the first few tubes as a clean deposit The curves of free HCl and T A show a steady rise up to one and a half hours, at which time the free HCl attains a height varying around 30 per cent This is followed by the steadily falling curve of neutralization which rests at approximately 0 at three and a half hours or before

The experiments of Bennett and Ryle [1] show that 80 per cent of healthy men give a curve of this type with little variation in the amount of acid secretion The curve produced by the same individual on various occasions has been shown to be remarkably constant Bile has been found in the R F in 10 per cent of healthy men

The finding of this type of curve proves that there is no interference with pyloric function that there is no *achalasia* (failure of the pylorus to dilate to peristalsis) spasm or stenosis

The curve shows that the balance between secretion and neutralization is normal

All specimens contain a marked excess of ropy mucus

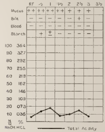

Chart 2 —Gastritis

Chart 2 shows the findings in a case of gastritis

There is complete achlorhydria in this particular case and hypochlorhydria in others Low T A No evidence of delay or obstruction in the R F No anæmia of the patient

The free HCl content is always low in the presence of excess mucus These patients mostly have some difficulty in swallowing the tube on account of the sensitive pharynx and reflex irritability which accompanies chronic gastritis

Lyle [1] classifies hypochlorhydria and achlorhydria in disease as due [illegible] consequent upon [illegible] of the [illegible] gastro-jejunostomy (2) Neutralisation by the [illegible] from the surface of a malignant growth (3) Neutralisation and [illegible] of acid secretion by an excessive output of mucus as in gastritis

Gastric Ulcer

The findings in cases of gastric ulcer mainly depend on the position of the ulcer in relation to the pylorus and to the length of time that the ulcer has been present

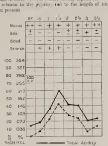

Chart 5 —Gastric ulcer

If pyloric function is not disturbed and gastric motility not affected, then the examination may closely approach the normal type in spite of the presence of an organic lesion situated in the body of the stomach The test meal does not help in any marked degree unless there is some pyloro spasm due to reflex irritation

The emptying rate is delayed in most cases

The free acidity of the h F may be raised from 0—5 per cent but the curve may show little departure from the normal limits

Blood may be seen at three hours

Chart 3 is from a case of gastric ulcer who [illegible] dyspepsia since 1917, and had suffered almost [illegible] two months with pain at two hours after food and [illegible]. Loss of weight and some anaemia.

Admitted to hospital as a case of duodenal ulcer and advised operative treatment. There was definite epigastric tenderness.

X ray Report.—"Abnormal increase of tone and peristalsis. *Caput duodeni* appeared small and irregular. Stomach dilated and ptosed at first

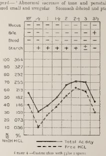

CHART 4.—Gastric ulcer with pylorospasm.

[illegible]d markedly hypertonic, afterwards becoming hypotonic, suggesting a [illegible] of pyloric or duodenal obstruction, ? duodenal ulcer." The examination points to an old standing lesion of the duodenum with partial [illegible]truction.

The fractional analysis shows that there is excess mucus in all samples [illegible] evidence of dilatation of the stomach.

A small amount of bile is seen at the normal time and neutralization [illegible] the duodenum takes place slowly, being incomplete at three and a half hours. No blood. This chart tends to negative the presence of an old duodenal ulcer causing marked derangement of pyloric function and merely shows evidence of delay.

The R F does not show any excess acidity, as would have been the case in a duodenal ulcer, nor is there any late high concentration of acidity, due to pyloric spasm or stenosis.

The report on this case suggested a chronic gastritis with dilatation and stated that there was no positive evidence of a duodenal ulcer.

Operation Findings.—Pylorus much thickened. An ulcer on lesser curvature at pyloric antrum, with adhesions between the posterior wall of the stomach and the lesser sac. Posterior gastro enterostomy performed.

One case, in which a large gastric ulcer was found to be situated on the lesser curvature and close to the œsophagus, gave a chart and curve which suggested a pyloric ulcer owing to an hour glass contraction of the stomach with pyloric spasm.

In this latter case starch was present in all samples up to three hours, after which bile entered and neutralization took place. See Chart 4.

Chart 4 is a case of gastric ulcer with a history of three months pain and vomiting.

X-ray Report.—"On taking the barium emulsion a condition of marked hour glass contraction of the stomach revealed itself, the spasm passed off within a few minutes, and the crater of a gastric ulcer was seen on the lesser curvature."

Operation revealed a large ulcer on the lesser curvature and close to the œsophagus. Posterior gastro enterostomy performed.

The test meal report shows excess acidity in the R F. There is delay of the meal in the stomach. No bile or neutralization before three and a half hours. There is a "climbing" curve and sustained hyperchlorhydria up to three hours. This chart shows the presence of pyloric spasm causing the retained acidity in the R F, the results, in this case, of a gastric ulcer with hour-glass contraction and spasm of the pyloric sphincter.

Pyloric Ulcer

In pyloric ulcer the fractional examination gives some definite indication of the pathological condition.

There is moderately high acidity in the R F, followed by some degree of hyperchlorhydria and defect in neutralization.

The curve of free HCl depends on the degree of pyloric spasm or achalasia; the three main types of curve produced are as follows: (1) A steady rise to a sustained plateau; (2) the climbing curve of increasing concentration; (3) that producing a secondary rise after a period of temporary fall by neutralization.

The emptying rate is variable and depends on the length of time that the ulcer has been present. At first there is hypermotility to overcome [illegible] this is followed by some degree of dilatation, stasis and [illegible] causing slow emptying.

Blood may be seen at two and a half to three hours when the pylorus is contracting after the passage of the meal.

Hyperchlorhydria is present in proportion to the amount of stenosis.

The samples are taken off with ease and are clean unless altered blood is present.

With reference to hyperchlorhydria Ryle (1) states "There is no

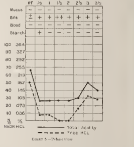

CHART 5.—Pyloric ulcer.

[illegible] any justification for the employment of 'hyperchlorhydria' and [illegible] in a diagnostic sense. The majority of dyspeptic cases [illegible] have been diagnosed as hyperchlorhydria are now [illegible] to have either a duodenal ulcer or some other organic irritative [illegible]. The majority of cases showing achlorhydria are found to be [illegible] pyloric insufficiency with gastric hypotonus due to general causes, from local diseases such as gastritis or carcinoma or from general diseases such as Addison's anaemia."

Bennett and Ryle (1) have shown that 80 per cent of healthy men have free acidity which only varies between limited degrees

In the absence of any symptoms neither hyperchlorhydria nor achlorhydria can in themselves be regarded as pathological findings It is by observing the function of neutralization that it is possible to gauge the presence of organic lesions affecting the pylorus Hurst (4) has shown that there is a close sensory connection between the pylorus and other sphincters of the alimentary canal thus explaining the pyloric spasm in a case of gastric ulcer situated near the cardiac sphincter Gall stones, cholecystitis and chronic appendicitis may also cause reflex pyloric spasm

Chart 5 shows the findings in a case of pyloric ulcer which was adherent to the gall-bladder

Admitted to hospital for pain after food and symptoms suggestive of pyloric obstruction

X-ray Report — Stomach is hypertonic and peristalsis abnormally active Deformity of duodenal cap with a protrusion of the base towards the lesser curvature side Diagnosis—chronic duodenal ulcer

The test meal showed large samples—all containing a considerable amount of bile No evidence of obstruction in the R F, but a high resting acidity Free HCl curve kept at low figure by the bile, but seen to rise as the bile lessens Slow emptying, as seen by the stasis of bile The report suggested a lesion causing pyloric obstruction at, or near the gall-bladder

Operation —Pyloric ulcer was found adherent to the gall bladder Gastro-jejunostomy was performed

Chart 5A is from a man admitted with a short history of epigastric pain after meals which was relieved by vomiting On examination there was some rigidity of the upper part of the recti muscles and tenderness in the epigastrium Occult blood present in the stools

X-ray Report — The stomach is hypertonic, peristalsis increased There is an apparent filling defect of the *pars pylorica* with interruption of the peristalsis and irregular narrowing of the lumen of the stomach No defect of the *caput duodeni*

" The *x-ray* appearances suggest an ulcer of the pyloric portion of the stomach

Fractional test meal examination showed an excessive amount of resting fluid which was bile stained (100 c c) No blood or excess mucus. Bile enters at 1½ hours and again at 3½ hours The stomach empties rapidly There is a rapid and excessive rise in free HCl at ½ and 1 hour followed by sudden neutralization from the duodenum and bile entry Then follows a second phase of high concentration of free HCl up to 3 hours again followed by neutralization at 3½ hours

There is hypermotility with a spasmodic condition of the pylorus, but not complete stenosis

This examination suggests a spasmodic state of the pylorus, due to a juxta-pyloric ulcer. The hyperchlorhydria and hypersecretion are also very suggestive of an organic irritative lesion near the pylorus.

Operation Finding.—"An indurated ulcer was found on the lesser curvature of the stomach about 1½ in. from the pylorus."

Gastro-jejunostomy was performed.

Many cases show a temporary neutralization at two to two and a half hours, followed by spasms of the pylorus and producing the characteristic secondary rise in the concentration of acidity.

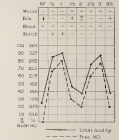

CHART 5A.—Pyloric ulcer.

Others show irregular entry of bile, which is often quickly ejected by the hypermotility of the stomach.

It is at the period of two to three and a half hours that the action of the pylorus may be studied by the physical characters of the samples in addition to the concentration of acidity in the stomach.

The finding of blood in the later samples may considerably assist the diagnosis.

[illegible] the normal series [illegible] possible [illegible] present which [illegible] of [illegible]

Ryle [illegible] findings in pyloric [illegible] as follows We [illegible] that the practical utility of the [illegible] method as a [illegible] studying gastric function has been [illegible] established [illegible] clinical work is great, but it must not be [illegible] as a 'diagnostic [illegible] excepting in the presence of obstructive [illegible]

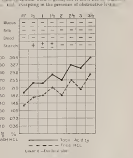

Chart 6 —Duodenal ulcer

Duodenal Ulcer

It has been seen that the findings in gastric ulcer may not always give definite results and that ulcers near the pylorus give fairly consistent evidence of the pathological condition but it is in the cases of duodenal ulcer that the most characteristic, and often diagnostic, features are produced with marked frequency

These samples are easily obtained, clear and highly acid

The R F is in excess and contains a very high percentage of free HCl also occasionally a little bile.

The [illegible]. The other samples are clear or opalescent and are [illegible] bile only enters in small quantities and late in time [illegible] which remains at a high figure throughout, producing the characteristic curve of hyperchlorhydria and hypersecretion

There is complete failure in neutralization in cases of stenosis, and only a moderate fall in the curve if a small amount of duodenal fluid is permitted to enter the stomach

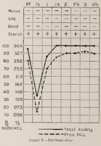

Chart 7.—Duodenal ulcer

Hypermotility and hypersecretion are cause and effect in advanced cases there is dilatation and stasis

The following cases show clearly the features that are considered as pointing to the presence of an active duodenal ulcer—these findings being produced with remarkable consistency

Chart 6 is from a case of chronic duodenal ulcer, who had a typical history of "gnawing" pain at one hour after meals—relieved by the taking of more food Three years duration of periodical attacks, becoming more severe and almost continuous for the last three months Local tenderness over the area of the duodenum

X-ray Examination.—"Marked distortion of [illegible]—suggesting a chronic ulcer and cicatrization."

This patient refused operative treatment.

The test meal showed large, clear, watery samples. No blood. No bile entry or neutralization. No excess mucus. High acidity in the R.F. followed by the typical climbing curve of increasing concentration—even at three and a half hours. Marked hypersecretion and hyperchlorhydria. Rapid emptying is followed by sustained stenosis of the pylorus.

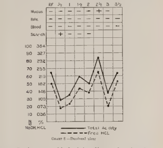

CHART 6.—Duodenal ulcer.

Chart 7 is from a case of duodenal ulcer of long standing where there was no difficulty in making a clinical diagnosis. The patient complained of pain at the delayed time after food and occasionally had attacks of vomiting of large quantities of highly acid fluid.

X-ray Report.—Stomach at first hypertonic and exhibited hyperperistalsis, becoming atonic one hour after the ingestion of the meal and showed a small gastric residue up to eight hours. There was a constant deformity of the pylorus. X-ray findings suggest an ulcer adjoining the pylorus.

The [illegible] Blood [illegible]
No evidence of [illegible] blood [illegible]

Starch [illegible] the meal [illegible]

The [illegible] in this particular case is considered [illegible] diagnostic of a duodenal ulcer when compared with the clinical signs [illegible] ray report No evidence of [illegible] neutralization or relaxation of the pylorus [illegible]

The above chart is one of extreme type producing all the diagnostic features

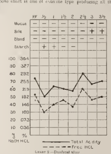

Chart 9 —Duodenal ulcer

Operation —A large chronic duodenal ulcer was found to be adherent [illegible] the head of the pancreas Gastro jejunostomy was performed

Chart 8 is from a man admitted for epigastric pain, vomiting and the [illegible] of blood in the stools History of five years duration of attacks of pain one and a half hours after meals no pain at night

X-ray Report —"No pyloric obstruction Hypertonic stomach No [illegible] evidence of duodenal ulceration, but there is some increase of tone and peristalsis

Operation.—A definite duodenal ulcer found, [illegible] the pylorus [illegible]. Gastro-duodenostomy was performed.

The test-meal chart shows very definite evidence of the pathological condition. All the samples were easily filtered, clear, watery and highly [illegible]. Stomach empties rapidly. No bile in any sample. Some white stringy mucus seen at two and a half hours. Excess acidity in [illegible]. The acidity curve shows an increasing concentration up to two and a half hours—then there is a temporary relaxation of the pyloric spasm followed by a secondary rise to a level which remains as the testing [illegible].

The diagnostic features are: (1) The character of the samples. (2) rapid emptying. (3) increasing and sustained hyperchlorhydria and hypersecretion. (4) failure of neutralization.

Chart 31 is a case who had pain of the duodenal ulcer type for two years with attacks of acute pain at times. [illegible] with a history of haematemesis on one occasion.

X-ray Report.—Rapid emptying. Duodenal cap deformed [illegible] and a flake of food remaining apparently in the base [illegible] the

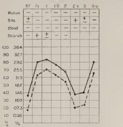

Chart 30. Duodenal ulcer.

[illegible] in four hours X ray evidence points to the presence of a [illegible] ulcer

Operation.—An ulcer—the size of a [illegible] was found on the anterior aspect of the first part of the duodenum [illegible] the pylorus the base was stippled red

The test-meal examination again shows the [illegible] watery and highly acid samples Rapid emptying. Bile only seen in a small amount, at three hours There is hyperchlorhydria with failure of neutralization

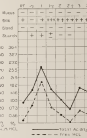

CHART 11.—G ill steps

This type of case demonstrates that the pylorus is in a state of chronic spasm and does not dilate after the meal has once been forcibly ejected through it by the hypertonic stomach

Chart 10 is from a case of duodenal ulcer who was admitted with only a short history of pain after food Tenderness in the epigastrium where a small tumour could be felt

X-ray Report.—Active peristalsis Pyloric sphincter did not relax for seven minutes Pain on passage of barium meal into duodenum Constant deformity of the duodenum X ray findings suggest a penetrating ulcer of the outer part of the first part of the duodenum, near the pylorus

Copy of fractional test meal report.— Bile seen in R.F., at two and a half hours, and a trace at three hours. Stomach empties rapidly. Excess acidity in R.F. with hyperchlorhydria up to two hours, when there is some neutralization by the bile entry, after which there is again a high concentration causing a secondary rise. The examination suggests the presence of a duodenal ulcer which is not causing complete stenosis of the pylorus.

Operation.—A well-marked duodenal ulcer was found above the post-pyloric fornix. Gastro duodenostomy performed.

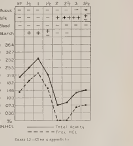

CHART 12.—Chronic appendicitis.

Chart 11 is from a case of gall stones causing pressure on the duodenum. Symptoms of chronic dyspepsia and occasional vomiting.

X-ray examination did not find any evident abnormality.

Test meal findings show early emptying of the stomach and early excessive bile content at one and a half hours and in all the later samples. Sharp rise and fall in acidity, followed by a secondary rise at three hours; there is early neutralization. The specimens were small and not readily obtained. This examination result follows those of Hunter [4].

[illegible] gall bladder [illegible] gall stones [illegible] removed.

Gall [illegible] ions produce [illegible] [illegible]

Chart [illegible] who was admitted for symptoms suggesting [illegible] gall [illegible]

History since 1914 [illegible] of dyspepsia and constipation

X-ray examination [illegible] this case

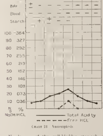

CHART 13 Visceroptosis

[illegible] *ration*.—No disease of the gall bladder stomach or duodenum. [illegible] was divided between the gall bladder and stomach. Appendix was [illegible] ject of chronic inflammation, the mucous membrane being replaced [illegible] fibrous tissue

[illegible] meal report shows hyperacidity in the R F, followed by a sharp [illegible] to one hour. Neutralization takes place rapidly by increased entry [illegible] duodenal fluids followed again by a secondary rise and a high [illegible] acidity caused in this case by reflex pyloric spasm. The stomach [illegible] shortly before the normal time and there is marked hyperchlor- [illegible] and hypersecretion the early samples being large and clear [illegible] chart of this type that it is [illegible] [illegible] with confidence

[illegible] is taken as showing the findings [illegible] of atonic dyspepsia with [illegible]

Th[illegible] of the report closely follows th[illegible] [illegible]ported by Hunter [4] namely small samples obtained with difficulty [illegible] grey and mucoid Very littl[illegible] of bile and early disappearance of starch Almost complete a[illegible]hydria and low acidity

CARCINOMA OF THE STOMACH

There [illegible] need to emphasize the importance of early diagnosis in this condition

Pr[illegible] in an article entitled The Early Diagnosis of Cancer of the Stomach by means of Gastric Analysis, describes the features of the positive diagnostic picture and summarizes as follows If the patient be suitably prepared overnight and a careful examination of the fasting fluid [illegible] on the following morning evidence either of stagnation or of [illegible] with aberrant secretion, or of both will be found in the vast majority of cases of gastric carcinoma and these signs are not likely to be confused with those given by other diseases

Al[illegible] Gastric analysis should be regarded as a clinical and not as a laboratory procedure if this were recognized and if the observer would seek for the evidence outlined the early diagnosis of cancer of the stomach would be enormously improved and the percentage of operable cases notably increased

Bennett states that experience leads him to believe that it is exceedingly rare for a case of carcinoma of the stomach to present itself for examination without the diagnosis being definitely established as soon as gastric analysis is performed

The preparation in order to demonstrate stagnation is to give the patient two teaspoonsful of finely divided charcoal in a glass of milk overnight, with perhaps a charcoal biscuit as well The diagnostic findings in the R F are those of bleeding and evidence of stagnation—a turbid fluid with foul smell dirty deposits presence of blood and recovery of charcoal, and there is often a sour smell from the excess lactic acid and a relatively high total acidity Boas Oppler bacilli may be found in cases of fermentation

Hunter [4] reports a series of fifteen cases in which ten (67 per cent) had complete achlorhydria of the remaining five two would pass for normal two were of the climbing type and one showed a sudden rise and a high plateau

The reports from the Mayo Clinic on an examination of 591 cases of gastric carcinoma give achlorhydria in about half hypochlorhydria in 16 per cent, normal acidity in 20 per cent and hyperchlorhydria in 7 per cent The presence or absence of free HCl does not affect the diagnosis so much as previously as it has been proved that free HCl may be secreted and found in gastric carcinoma especially in those cases where a pyloric ulcer has become malignant

The later samples of the testmeal generally contain blood or "coffee grounds," are copious and dirty in character and give evidence of obstruction if stenosis is present

Hicks [9] shows that the *proteose* content is increased in the samples of gastric fluid in carcinoma

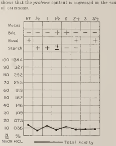

Chart 14 —Carcinoma of the stomach

Normal fluids give precipitation with ammonium sulphate up to a dilution of 1 60 In cases of verified carcinoma positive results are obtained in much higher dilutions, the precipitation has been shown to be due to a proteose and not to serum protein from blood

Chart 14 is from a patient aged 59 suffering from a carcinoma situated at the pyloric end of the stomach Tumour palpable

X ray Examination—" There is a gross deformity of the stomach in the *pars pylorica* with a double construction Stomach empty except for a trace at four hours after the meal Diagnosis—malignant growth

Fest-meal examination showed that there was blood in the R F which also contained a dirty deposit having a sour smell Charcoal present with other evidence of delay and partial obstruction Blood seen in some of the later samples also some tissue fragments. Complete achlorhydria in all samples

Addison's Anemia

In true cases of Addison's anemia, free HCl is invariably absent throughout the whole period of digestion The finding of free HCl is a decisive point against the case being a true type

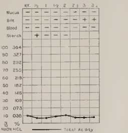

Chart 15 — Addison's anemia

The achlorhydria (achylia) is now considered to be the indirect cause of the anemia and not a secondary condition [5] this achylia persisting in spite of clinical improvement

Congenital achylia is the inherited factor in cases of familial Addison's anemia

Achlorhydria was found in 4 per cent of healthy men investigated by Ryle and Bennett [1]

The diagnosis in doubtful cases of anemia can be assisted by a fractional gastric analysis [illegible] of advanced Addison's anaemia in a [illegible] [illegible] of [illegible] years duration but no family history.

Blood [illegible]	Red cells per c.mm.	1,600,000
	Haemoglobin per cent	60
	Colour index	1.9
	White cells per c.mm.	3,500

[illegible] anisocytosis and poikilocytosis. Punctate [illegible] [illegible].

[illegible] under treatment.

The [illegible] [illegible] acid rhythm and low total acidity. [illegible] [illegible] mucus. No evidence of delay or [illegible].

The [illegible] cases are intended to illustrate the main characters which indicate [illegible] pathological conditions together with the type of information that may be obtained in this useful clinical function test which can be [illegible] without unduly distressing the patient. In disease [illegible] many factors introduced which may alter the normal type of [illegible] meal itself varying in individual persons—which makes [illegible] carefully balance the test meal findings with the clinical [illegible] report. It has been shown that the surgeon is able to gain [illegible] additional information before he operates for the relief of [illegible] and gall-bladder affections. Negative evidence is often of great value in investigating a case of doubtful clinical character.

In [illegible] I would wish to thank Surgeon Captain F. H. Nimmo, M.V.O., and Surgeon Captain J. R. Muir, F.R.C.S., for the use of the clinical reports and operation findings, also Surgeon Commander W. H. Hastings for the X-ray reports on the cases.

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II

PHYSICAL TRAINING AND ITS PROGRESS, PAST AND FUTURE

SURGEON [illegible] H. E. HILL, M.B., B.S., M.R.C.S., [illegible]

[illegible] Physical and Recreational Training

THE common thud of a heavy club wielded by an [illegible] biceps crashing through the skull of an opponent has long since been discarded as the highest attainment in either offensive or defensive [illegible].

When it was realized that something more than this was [illegible], attention in physical training was turned from the development of one or two muscles (biceps, etc.) to all the single groups of muscles [illegible] dorsal muscles, abdominal muscles and so forth. This is now only practised for medical reasons.

The present method of physical training consists of the study of the groups of muscles in relation to one another; to study, for instance, when the arm moves what other groups of muscles come into play, under what circumstances they hinder or help, and which groups are inhibited [illegible]. The idea lying at the bottom of this is that agility, quickness and fitness are a greater asset than the "common thud." This muscular contraction together with inhibition of other groups forms the basis of the complicated muscular movements (henceforth referred to in this paper as C.M.M.) performed in the human body to-day. In order that these C.M.M. may be carried out correctly they have to be reproduced at will and controlled. This is done by the brain. It will therefore be seen that the more complicated the movements of muscles become the more highly will the brain have to be developed in order to control them, and *vice versa*, and it has been the effect of these C.M.M. on the brain which has developed it and brought man to his present position in the world.

The method by which this took place is described in Professor Elliot Smith's recent book, "Essays on the Evolution of Man."

Therefore fantastic and purposeless movements of various isolated parts of the body, especially those which are uninteresting, are of no value whatsoever to a normal human body. Further progress in physical training lies in the study of the registration of C.M.M. in the brain, their correct control and the nature of the reflexes concerned. Awkward or clumsy movements are entirely due to lack of proper control by the brain of the various groups of muscles in use at the time. A boxer who developed a sledge-hammer blow with his right fist would obviously be quite ineffective against an agile man whose muscle groups were educated to be under the control of the brain.

An oyster has little or no discrimination, but as our bodies became more complex and increasing groups of muscles acted in response to multiple stimuli or sensations which poured into the brain from all parts of the body, it became necessary to interpret all these sensations and dis [illegible] telist [illegible] [illegible] [illegible] [illegible] the higher [illegible] discrimination was [illegible] in the brain This int[illegible] [illegible] nation between stimuli express themselves directly in the behaviour [illegible] movements of the animal set into action through the motor area—itself a part of the brain [2] As these C M M were repeated they became registered in the brain as the act of dressing does These movements when registered could be produced at will and in this way the power of memory became created As memory became more developed the results of former actions could be recalled and now the animal was able to profit by experience and the creatures which succeeded by their brain power in subordinating instincts to reason made it possible for themselves to bring the effects of individual experience to bear on conduct and the power of reason was created [3]

The ability to learn by experience necessarily implies the development somewhere in the brain of a something which can act not only as a receptive organ for impressions of the senses and as a means for securing that their influence will modify behaviour, but will also serve as a recording apparatus for storing such impressions so that they can be revived in memory at some future time when occasion arises [4]

This area is found in brains of mammals in the cortex and Professor Elliot Smith has named it the "neopallium" Into it pathways lead from all the sense organs and each area of reception (visual acoustic, tactile &c) are linked up with each other The neopallium acts as a whole, receiving these impressions, interpreting them and so controlling the body This faculty of the brain for interpreting sensations registering the C M M but above all the power of controlling these C M M not only applied to body muscles but to the muscles of the eyes as well The eyes became more freely and easily movable and eventually the power of focusing was created As the range of movements of the eye increased and the muscular effort of focusing on objects was initiated animals became able to fix objects with their eyes and so attention was created and the ability for concentration followed The higher primates could now appreciate the form and size of objects by following their outline by means of delicate eye movements

Under the guidance of vision the hands were able to acquire skill in action and incidentally to become the instruments of an increasingly sensitive tactile discrimination which again reacted upon the motor mechanisms and made possible the attainment of still higher degrees of muscular skill This in turn reacted upon the control of ocular movements and prepared the way for the acquisition of stereoscopic vision and a fuller understanding of the surrounding world [5]

The high specialization of the sense of sight awakened curiosity, and stereoscopic vision which now made its appearance enabled the creature to judge of shape and distance also texture and supplied guidance to the hands in executing [illegible] skilled movements "Attention" was then created and "curiosity" and concentration could then be better made on muscles for the performance of still more delicate and finely adjusted movements

The manner in which stereoscopic vision was created in the lower animals is explained in Professor Elliot Smith's book "Essays on the Evolution of Man"

The attainment of stereoscopic vision enormously enhanced the value of information obtained by the eyes shape, size, form, colour texture and solidity were now conveyed to the mind Interest and curiosity were aroused and the hands could make more accurate movements and tactile sensation became more keen and also estimation of weight

Hence C M M produced in the brain the higher powers of discrimination memory, the ability to profit by experience and the powers of attention and concentration interest and also curiosity—all of which we use in everyday life These abilities are the ones which produced man and they distinguish him from all other beings

When our ancestors took to the trees two great changes took place which eventually led to man the movements from bough to bough necessitated C M M which brought in their train increased discrimination memory, ability to profit by experience attention and concentration Not only this the animal had no longer its nose to the ground which made the sense of smell vital but now it had to depend on vision for its food and safety From these arboreal animals right up to man there is a steady and uniform development in the brain of the power of controlling C M M, and a very large increase in the visual centres on the surface of the brain

The motor area in the neopallium is kept in intimate relation with the muscles, tendons, skin eyes &c and controls the voluntary movements based on these impressions The neopallium having developed and established an understanding and control of complicated muscular movement it is this part of the body which we must study if we wish to make further advances in physical training Hence C M M have made us what we are by developing the brain, and that is the path on which we must proceed

To have a good effect on the brain it follows that the movements to be registered properly must be correct and precise (drill) and that the movements must be complicated (games) to keep the brain capable of controlling C M M (agility) Also that while the movements are performed the brain shall take notice of what is going on, therefore the work must be interesting

As an example of what this path of physical training will lead to take the example of Hobbs His vision (the power of stereoscopic vision) is so acute that after the ball has left the bowler's hand he is capable of locating that ball in space and judging its speed some considerable time before the [illegible]inary mortal. [illegible] interprets this analysis correctly, and he has time to perform th[illegible] of getting the rest of his body into the [illegible]quired position to [illegible] the ball. These movements have become registered in his brain and he can hit a 6 or 4 almost when he wants to. H[illegible] reflexes are well timed and correct. A batsman without these [illegible]lities remains till until the ball is almost past, and then makes an awkward [illegible] at it, and he is lucky if he misses it and does not snick it into the slips.

The [illegible] must be trained. A muscle by itself cannot be educated any more th[illegible] a liver or a spleen [illegible] or a stone, for a muscle cannot move without [illegible] controlling impulse from the brain. If one wishes to study the movement of the hands of a clock, especially in their relation to one another, [illegible] is no use looking at the hands. The works must be examined and studied. The movements of muscles must be studied in the same way: the works must be studied, namely the brain, nervous system and [illegible]ulation to which the muscle is connected. The object of physical training is not the production of ponderous muscle, but agility, and the power of agility lies in the neopallium. Whatever the theories of man's evolution may be, one clear and unquestionable factor, namely, the steady and uniform development of the brain along a well defined course throughout th[illegible] primates right up to man, has taken place, and this course has decided th[illegible] evolution of the body. [6]

We have now seen how the development of the brain, and the forma[illegible] of the all important neopallium, was brought about by complicated [illegible] movements. Further, the erect attitude was brought about by th[illegible] development of the neopallium, which made skilled movements of the [illegible] possible and of some purpose in the struggle for existence.

[illegible] specialization of one pair of limbs for progression and the other [illegible] prehension and fine movements, prepared the way for the appearance [illegible] characteristics. [7]

"Skilful use of the hands was impossible without the appropriate posturing of the whole body." [8]

The comparison of the anatomy of a man with an ape, and its almost exact identity makes it quite clear that man and apes come from a common stock. The similarity of the blood reaction of the anthropoids and man together with their susceptibility to the same diseases cannot do anything else except establish the fact of their common descent, but the ape remains where it is because the neopallium is still under the influence of his senses. Without a fuller appreciation of the consequences of its actions the animal is not able to make full use of the skill it possesses. [9] Therefore the [illegible] of the neopallium is essential for further progress. The [illegible]opallium in the ape does not understand the feelings of the animal and [illegible] therefore unable to store up an intelligent memory of them, that is the [illegible] is unable to profit very much by experience. In short, apes' impressions [illegible] meaning.

Suddenly shout "Hi!" to an oyster, the vibration impinging on its [illegible] internally or interpret [illegible] an ape the vibrations [illegible] A loud shout of a [illegible] the edge of the [illegible] to action such as [illegible] the product of C M M [illegible] and safety

The ability to perform [illegible] movements leads to a marked enrichment of the [illegible]'s structure

[illegible] Sir Elliot Smith says —

"The mere process of learning to execute any act of skill necessarily involves the cultivation not only of the muscles which produce the movement and the cortical area which excites the actions of these muscles but in even greater measure the sensory mechanisms in the neopallium which are receiving impressions from the skin the muscles and the eyes to control the movements at the moment and incidentally are educating these cortical areas stimulating their growth and enriching the mental structure with new elements of experience Out of the experience gained in constantly performing acts of skill the knowledge of cause and effect is eventually acquired Thus the high specialization of the motor area which made complicated actions possible and the great expansion of the temporo-parietal area which enabled the ape man to realize the meaning of events occurring around it reacted one upon the other so that the creature came to understand that a particular act would entail certain consequences In other words it gradually acquired the faculty of shaping its conduct in anticipation of results (10)

"In organisms endowed with the power of voluntary movement which necessarily involves the ability to choose between conflicting impulses the fundamental condition of progress is the attainment of quickness of appropriate response The evolution of the nervous system is the means employed to enable increasingly complex and more completely adapted muscular actions to be performed with promptitude and precision The brain in mammals differs from all other living creatures in having acquired a true neopallium which is an instrument of almost unlimited potentialities for the cultivation of skilled movements of increasing degrees of complexity and adaptation to divers circumstances The human cerebral cortex provides the vital mechanism that can be fashioned by education to imitate and control an almost endless variety and complexity of muscular actions It is able to perform these functions in virtue of the fulness of the information it obtains from a variety of sense organs and the efficiency of the amazing machinery in the central nervous system for integrating the effects of these afferent currents and for controlling increasingly complex combinations of groups of muscles

But even more important still is the ability of the neopallium by some means which is quite unknown, to record the results of past experience and to put the influence of such knowledge at the service of the whole [illegible] system This provides the means whereby behaviour can be [illegible] in the light of knowledge but also enables a high degree of [illegible]ism to be acquired by training, which is perhaps the most essential [illegible] in the attainment of high degrees of skill [11]

[illegible] evolution of man the attainment of increasingly skilled movement [illegible] the growth of mind

DEDUCTIONS

(1) Physical exercise and training should consist of complicated muscular [illegible] for a definite object, as in games, fencing and boxing [illegible] movements of isolated groups of muscles are useless, by them [illegible] learns nothing and even if continuation of the movement daily [illegible] the size of the group of muscles as soon as the exercise [illegible] group of muscles rapidly reverts to the normal muscular [illegible] the body In fact in some cases excessive muscular develop[illegible] muscles does harm a fact well known in the medical [illegible]

[illegible] fundamental condition of progress both in ordinary life and [illegible] is the attainment of quickness of appropriate response to [illegible]mands) This depends entirely on the brain and nervous [illegible] messages which the brain receives from the eye, ear or skin [illegible] pallium must be educated

(d) Any [illegible] of one part of the body even the movements of the hands [illegible] the contraction of large areas of other muscles For instance [illegible] of the hands is impossible without appropriate posturing of the whole of the body Still more so are these muscles of the trunk contracted and used when the very heavy arms are revolving windmill fashion This restricts normal breathing Therefore in breathing exercises the arms should not be used

(4) Appropriate and correct movements can be recorded in the neopallium therefore all movements which are practised should be taught correctly in every detail otherwise wrong movements will be registered in the brain and this registration of wrong movements is very difficult to get rid of

(5) Complete registration of the muscular movements used in a certain action enables a high degree of automatism to be "acquired by training, and this is perhaps the most essential factor in the attainment of high degrees of skill [11]

(6) It was this last principle that made me compare the teaching of [illegible] in fencing and amateur boxing

Fencing is taught under exactly the same conditions as a fight The [illegible] garments are used during instruction as during a fight The move[illegible] are similar in both cases and so during instruction they are [illegible] and will be registered in the neopallium until they can be reproduced [illegible]tically during a fight leaving the brain free for the higher points of [illegible] and strategy The opponent is there with his ever-menacing blade

[illegible] period of instruction is, as near as possible, a reproduction of an [illegible] important thing [illegible] introd [illegible] all the [illegible] instantly [illegible] ng

[illegible] the best [illegible] is [illegible] Amateur boxers cannot compete [illegible] with professionals and this I think is chiefly due to the absence during instruction of the hard hitting "sparring partner" Boxing is not taught under the conditions of a fight Any rig is worn and the movements taught are in no way similar to those used during a contest Footwork is taught by making the pupil shuffle round a gymnasium or gyrate round a punching ball The pupil learns to adapt his footwork to blows dealt on a stationary object (except for oscillation), and this is registered in his brain In the ring it is quite a different matter to adapt one's footwork to a dodging hard hitting opponent That which has been learnt during instruction now has to be suddenly modified the result being that the brain is apprehensive and the footwork faulty The movements of boxing are taught artificially and consist often of a series of aimless movements by numbers and poses chiefly the latter Two men are often put together to do attack and defence by numbers gently patting each other During the whole of the instruction incorrect movements are being registered in the neopallium under conditions which never prevail in the ring A dodging opponent completely upsets the movements taught during instruction The opponent does not wait to be hit The neopallium becomes bewildered

The movements registered of a punch are quite wrong A punch in a boxing class begins with force and ends in nothing—for fear of hitting an opposite number too hard or if there is no one opposing for fear of overbalancing and falling forward The body weight is carefully kept back In a fight this is reproduced and there will be little or no body weight in the punches It is obvious that a hard hitting "sparring partner" will do more in ten minutes to teach the neopallium its job than weeks of the best instructor The instruction for boxing should be modelled more on the actual conditions prevailing in the ring in the same way as that for fencing

Nothing is more calculated to upset movements which have been learnt by the brain under definite conditions and surroundings than to alter those conditions and surroundings or to introduce a new element The whole adjustment between memory brain muscle and reflexes breaks down

The sudden entrance into a real fight of a live, determined hard hitting and dodging opponent is the introduction of a new element of such extreme potency that the C M M of the boxer trained without a proper sparring partner becomes reduced to impotency under this new environment

Since the above was written I have been reading "Recent Advances in Physiology" by Evans The result of the work on conditioned reflexes [illegible] ... in the [illegible] ... response at [illegible] ...

It [illegible] ... the performance [illegible] interfered with [illegible] perfect, w[illegible] would a punch on th[illegible]

To practise boxing against an imaginary opponent [illegible] motion and non hitting class mates is waste of time The [illegible]viour of [illegible] [de]termined opponent in the ring during a fight is so different from what [illegible] [ac]customary during that sort of training that brain and muscles alike a[illegible] [be]wildered and the amateur looks and behaves like a novice

Take cricket as an example To shift into flannels don pads and gloves and take a cricket bat to the nets to practise hitting sixes and fours off an imaginary ball would not be conducive to run getting in matches The mere advent of a sarcastic " pro " with a ball who delivers a fast one on the legs would nullify all such previous movements which were registered in the brain and scatter all delusions to the four winds and these delusions would in all probability be accompanied on their journey by the leg stump

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Naval Medical History of the War

HISTORY OF THE MEDICAL UNIT OF THE ROYAL NAVAL DIVISION FROM ITS INCEPTION TO THE EVACUATION OF GALLIPOLI

By Surgeon Rear Admiral ARTHUR GASKELL, C.B., O.B.E., F.R.C.S., F.R.H.
Late A.D.M.S. of the Royal Naval Division

(Continued from p. 57.)

Except for a few minor advances every three or four days artillery duels took the place of trench fighting for the remainder of May. On May 19 the Royal Naval Division incurred unusually heavy casualties in one of these minor advances.

On May 16 the principal medical officers of the various divisions met and decided that thenceforward the position and description of all dressing stations in the peninsula ought to appear in the order papers of each division. By this time the system of trenches had become so complicated that wounded men often found it difficult to find their way to the regimental aid posts and thence to the advanced dressing stations. To obviate this difficulty in the Naval Division Area the A.D.M.S. set up in suitable positions small direction posts marked with a red cross.

About this time the temporary hospital ship *Somali* returned from Malta and landed Kenny with the tent sub-divisions of the Third Field Ambulance. Kenny encamped alongside the Second Field Ambulance in the main dressing station in the olive grove already described. The shelling of camps and trenches led to a daily toll of killed and wounded in the division, the camp of the divisional headquarters coming in for the largest number of shells. Diarrhœa increased and appeared to be chiefly due to the drinking of polluted water. The A.D.M.S. continued his urgent representations to have all water carts landed, but without effect, as landing of more vehicles of any description had been forbidden.

Some of the temporary surgeons did not appear to recognize that medical arrangements in war could not be conducted on the same lines as in peace, and that occasionally the individual had to suffer on account of military necessity. Consequently the A.D.M.S. issued the following medical order:—

XVII. May 20, 1915.

MEDICAL ORDERS.

The D.M.S. of the Mediterranean Expeditionary Force has addressed the following communication to me:—

"Certain men are being sent back from the front who are suffering from minor or chronic ailments which could either be alleviated by Regimental Medical Officers, or else the nature of the complaint holds out no prospect of immediate relief under war conditions, whilst the dug [illegible] use th[illegible] [illegible] during [illegible] period At this [illegible] [illegible]

[illegible] his services [illegible] the [illegible] extra work on his [illegible] [illegible] Regimental and other Medical [illegible] [illegible] this time [illegible] employed on fatigues which [illegible] [illegible] trenches The [illegible] [illegible] teeth [illegible] at the Casualty [illegible] Field Ambulance Dressing Station [illegible] all the Medical [illegible] Royal Naval D[illegible] [illegible] [illegible] the firing line [illegible]

Arthur Gaskell
[illegible] R N, and A D M S [illegible]

[illegible] some improvement [illegible] system of field telephones [illegible] and posts [illegible] dressing stations [illegible] station and casualty [illegible] constituted [illegible] improvements, and [illegible] to the efficiency [illegible] administration

On May 21 Surgeon M[illegible] received a [illegible] the abdomen [illegible] Up to this [illegible] not indulged in much [illegible] but they now began [illegible] discomfort.

The sanitation of the [illegible] presented itself as a difficult problem to all concerned The Corps Commander decided that the whole area should be divided into subareas, each Division being held responsible for the sanitation of its sub area The A D M S pointed out that any scheme of sanitation should be in the nature of a [illegible] organized scheme and he [illegible] drew up the following suggested scheme and enlisted the [illegible] of the French and other British Divisions —

Sanitation Scheme for R N D Area

26 6 15

1 Define the area exactly by well recognized objects and notice boards placed at intervals along the boundary

(2) Obtain a working party (say of 100 men) for each sub area and divide them into squads (say of four men) and allot a definite job to each squad and a definite time for completing the job

(3) For each sub area procure the following stores by loan from Divisional Train, Divisional Ordnance Stores and Divisional Supply Depot —

(a) 1 A T cart with mules and driver
(b) 1[illegible] gardener's brooms or bass brooms
(c) 1[illegible] large hay making or other rakes
(d) 2[illegible] picks
(e) 20 shovels
(f) 1 drum of paraffin oil
(g) 10 drums of cresol

[illegible]

[illegible]

[illegible]

[illegible] the [illegible]

(4) [illegible] along the [illegible] the collected [illegible] spots [illegible] be [illegible] destruct[illegible] suitable [illegible]

(5) Construct a certain number of public latrines [illegible] table place [illegible] the [illegible] preferably near road [illegible] for a working party to attend [illegible] daily

(6) Establish a regular pol[illegible] [illegible] it being soiled again

(7) Repair every suitable well [illegible] and rail off with barbed wire [illegible] each well [illegible] being calculated as 150 times the [illegible] any pumping, and after compl[illegible]

(8) Label all water unfit [illegible] chemicals Each well should [illegible] the area or other duly appointed [illegible]

(9) Detail a certain number of places [illegible] and drainage of such places [illegible] paragraph 1)

(10) Likewise detail places [illegible] troughs etc

(11) Fill disused trenches [illegible] have been soiled with excreta

(12) Set aside [illegible] —

(a) Human } [illegible] paragraph 1
(b) Animal }

(13) Complete any latrines which [illegible]

(14) Arrange with [illegible]

(15) Make use where possible [illegible] sea (*N B* — Animals must be [illegible])

(16) Burn [illegible]

(17) Issue Sanitary Orders to all [illegible]

(18) Keep in touch with the [illegible] enforced among the French troops [illegible]

(19) Apply from time to [illegible] Medical Officers and Staff Officers of the [illegible] may be co-operative [illegible] of flies and other vermin the [illegible] disease

(Signed) [illegible]

[illegible]

On May 22 Surgeon Creasy and [illegible] the medical unit were wounded

At about this time a distinct "jumpiness" became evident amongst some of the officers and men of the Division The Officer Commanding the *Howe* battalion reported that a small proportion of his men hitherto able, efficient and courageous had of late become depressed and had been frequently giving way to attacks of weeping thus being not only useless in themselves but also harmful in depressing the spirits of the other men. In spite of the danger of allowing men to think that an appeal to the medical officer on the grounds of nervous prostration would lead to them being sent to a comfortable rest camp—a danger of a few of such cases being immediately followed by a big rush of others—the D M S decided that these particular men should be sent to the convalescent camp at Mudros.

On May 27 H M S *Majestic* was sunk by a torpedo from an enemy's submarine while lying at anchor off Cape Helles. On this day also the A D M S and the A A and Q M G decided that something had to be done to give greater protection to the main dressing station in the olive grove to prevent the frequent casualties among wounded and medical unit personnel. Accordingly the engineer unit started excavating a large subterranean room in the rock close by.

On May 29 three medical officers and 149 other ranks arrived as reinforcements for the medical unit to fill vacancies in the three field ambulances.

On May 30 the *Collingwood* battalion, and on May 31 the *Benbow* battalion arrived. The chief medical events at this time consisted in anti-gas attack precautions increasing the protection of the regimental aid posts and establishing separate camps for the three field ambulances. This latter step became necessary to prevent dual command in one camp.

In this history of the medical unit it might appear desirable to include all orders issued on medical subjects. But this would entail a rather lengthy and wearisome record of (1) the special written medical orders issued by the A D M S to the Unit, (2) the verbal instructions issued, (3) the letters sent and received on certain medical subjects, and (4) medical orders incorporated in the daily divisional orders.

Therefore a few only of these latter are here attached to illustrate the general nature of these orders.

Copy of Medical Orders Incorporated in Divisional Orders

Supply of Water.—Water carts for troops at the front should fill up near where their units are instead of returning to the beach to get water.

Horses should as far as possible be watered at the front so as to economize the already failing supply near "W" Beach.

Great care is to be taken to avoid any pollution of the water or the ground round it.

No. 18? dated 15.5.15 paras 1 5 12

Medical.—All details of the R N Division who are placed on the sick list are to be sent to the 2nd Field Ambulance at 160 Y 6 near New Bridge and not to the Casualty Clearing Station. The 1st Field Ambulance is at "Y" beach where it has formed a Rest Camp for the Field Ambulances of the R N Division.

Cases of diarrhoea and dysentery have already occurred due to drinking water unboiled or unpurified. The Regimental Medical Officers with the aid of their water duty personnel will in conjunction with O C Units arrange for the purification of water by boiling or by chemicals. All ranks are to be warned against [illegible] supply arrangements [illegible]

CAMPING GROUNDS [illegible] foul through

(a) Refuse or horse [illegible]

(b) Not taking pre[illegible] special attention is to be paid to the above [illegible] each camp on the vital importance of san[illegible] is directed to "Standing Orders for the [illegible] Standing Orders (War) R N D Sect XIII, page [illegible] page 24 para 18 "Evacuation of quarters [illegible]

WATER CARTS —Owing to the [illegible] one per battalion will be allowed for the present [illegible] more [illegible] will return the surplus to the Divisional Transport Officer Capt Barton, A S C [illegible]

MEDICAL OFFICERS —No 136 dated 17 5 15 paras [illegible] and No 2 Cases have occurred of Regimental Medical Officers being ordered into the trenches to see patients during an engagement This is quite cont[illegible] custom which has been found most advisable in the Regular Army The correct procedure is that all sick and wounded shall be carried or direct[ed] to the Regimental Aid Post (a position of comparative safety where the Regimental Medical Officer should be stationed) by the Regimental Stretcher Bearers when circumstances permit thence onwards the patient is attended by the medical unit

DRESSING STATIONS MEDICAL —The main Dressing Station of the R N Division is situated at sq 168 Y 8 near the New Bridge, and the advanced dressing station is at 168 P 9 east of Sedd el Bahr Krithia Road about 500 yards to the S W of the 2 of 200 The dressing stations of other British divisions are situated at sq 168 C 5, Gully Beach sq 168 L 9, near Pink House sq 176 L 4 old "Y" beach sq 168 S 9, and sq 168 O 9

The position of the French dressing stations will be communicated later

CAMPING GROUNDS —With reference to Divisional Order No 135 dated 15 5 15, para 5 concerning sanitation of camping grounds it must be clearly understood that Brigade Commanders are responsible for the sanitation and that these matters are in the hands of the Executive Officers the Medical Officers duty being purely advisory

MOVE —No 140 dated 21 5 15 para. 6

The First Field Ambulance will proceed to sq 168 Y 6 on Monday next, and take over the duties now being carried out by 2nd Field Ambulance, which when relieved will proceed to Gully Beach

Transport will be arranged by O C Units direct with O C Train

DANGER OF FLIES —No 142 dated 24th May paras 13 14 15

A circular by the A D M S is circulated herewith for the information of all concerned.

DRESSING STATIONS —The 29th Division has established a new dressing station in addition to those appearing in Divisional Order No 136 dated 17 5 15 This station is situated on the "S E" branch of the West Krithia Road between Pink Farm and White House 800 yards from the former and 200 yards from the latter on the S E of the road

EVACUATION OF SICK — "X" beach will no longer be used for the evacuation of sick.

No 144 dated 25 5 15, paras 2 and 3

STRETCHER BEARERS —Attention is drawn to the regulations which define the duties and area of operations of stretcher bearers It is to be clearly understood that Regimental Stretcher Bearers are to operate between the firing line and the Regimental Aid Post Field Ambulance Stretcher Bearers will operate between the Regimental Aid Post area and the dressing stations

MEDICAL.—Surgeon Ballance of the Howe Batt. is to act as Senior Medical Officer of the 2nd Brigade.

No. 145 dated 27.5.15 paras. 1 and 2.

SANITATION AREAS.—The Southern end of the Peninsula has been divided into areas for sanitation purposes. The area allotted to the R.N. Division is:—

Southern Boundary.—The road from sq. 162 B 2 to sq. 162 D 4.

Eastern Boundary.—The road from sq. 162 D 4 to first pillar, thence along the line of pillars and from fifth pillar to Zimmerman Farm exclusive.

Western Boundary.—From Backhouse Post (sq. 169 L 3) along the valley running S.W. inclusive to the road at sq. 162 D 2.

This area will be divided into 3 sub areas as follows:—

No. 1 Sub Area. G.O.C. 1st Brigade.

No. 2 Sub Area. Commodore, 2nd Brigade.

No. 3 Sub Area. The Brigadier of the Brigade for the time being in the section of defence.

The above arrangement may at times result in a Brigadier being responsible temporarily for 2 sub areas, but this is unavoidable while the R.M. Bde., remain bivouacked in the 29th Division area. A sanitary medical officer will be detailed by the A.D.M.S. for each sub area to assist and advise Bde. Commanders concerned by supervising the sanitation. Arrangements are being made for each unit not belonging to the Division but which is bivouacked in the R.N.D. Area to detail a sanitary representative to assist in supervising sanitary arrangements. Each sub area is to be kept thoroughly *clean* by means of Regimental Sanitary Police and daily fatigue parties detailed under Brigade arrangements. Sub Areas will be patrolled by Brigade Police, and offenders severely dealt with.

A sanitary scheme is being drawn up by the A.D.M.S. and will be issued to all [illegible]. Units bivouacked in Areas outside that allotted to the R.N. Division will be responsible for sanitation within their lines. The G.O.C. R.M. Brigade for the Area in which the R.M. Brigade and Cyclist Co., is bivouacked. The Camp Commandant, H.Q. R.N.D. for Div. H.Q.

ANTI-CHOLERA VACCINATION.—A limited supply of anti-cholera vaccine is available at the Field Ambulance Dressing Stations. Any Officer or man desirous of receiving anti-cholera vaccination may be sent by the Regimental Medical Officer to the Dressing Station for this purpose when the Battalion comes out of the firing line.

No. 117 dated 29.5.15 para. 4.

ANTI-CHOLERA VACCINATION.—Officers and men requiring anti-cholera inoculation are to be collected in batches of twenty before proceeding to the Field Ambulance. The object of this is to prevent wastage of the vaccine when a phial is opened, each phial containing sufficient for twenty inoculations.

Copy of French Orders dated 26.5.15 para. 4.

SANITATION.—Certain hygienic rules appear to have been lost sight of: thus latrines are badly kept, some detachments have not even dug any, cooking places have the surrounding ground soiled by remnants which have not been buried, used bandages are left round pits in which they should have been buried. This is occurring particularly amongst small detachments 8th Engineers, [illegible] Sailors.

This could result in serious epidemics and must cease immediately.

All Commanding Officers must see to the strict observance of the rules for sanitation contained by the Army Order on the "Duties for Armies in the Field" (Art. 67).

Regimental Medical Officers must keep continual attention on this point.

A Sanitary Service is about to receive disinfectants which it will distribute in quantities.

The General has decided to deal severely with negligence of this order and

... commanding ... units and units ... responsible for ... No 148 dated 31 ... paras 1 and 6

Honours and Rewards.—His Majesty the King has been graciously pleased to approve the following honours and rewards:—

Distinguished Service Medal

No 941 Pte G Stockham R N Aux Sick Berth Rating Plymouth Battalion

No S 3440 Sgt N Roberts No 3 Fd Amb R N Division

Issued with Divisional Order No 142 of 24 5 15

DANGER OF FLIES

All ranks should be warned of the danger of flies as a medium by which disease is spread and steps should be taken by O C Units to carry out the following measures:—

(a) All articles of food and drink should be protected by some sort of fly tight cover

(b) Cookhouse refuse should be thrown into special pits one pit for solid and one for liquid refuse and the contents should be covered with at least six inches of earth three or four times a day Dry refuse from the camps should be burnt in incinerators

(c) Latrines should be as far as possible from the camp and should be to leeward Shallow trench latrines should be dug and filled in daily Care should be taken in constantly covering excreta

(d) Cresol solution three tablespoonfuls to a gallon of water should be sprinkled daily in all latrines and refuse pits Cresol can be obtained on indent on the Supply Officer at "W" Beach

(e) Animals should be kept as far as possible away from the camps and trenches The A D V S has been called upon to issue sanitary regulations concerning this

(f) O's C Units and their M O's are held responsible for the carrying out of these orders

VERMIN

Regimental Medical Officers should make careful weekly inspection of all men in their Battalion with a view to detection of vermin For the present all verminous clothing should be soaked in cresol solution

Typhus an extremely dangerous disease spread by lice is prevalent throughout the peninsula

Arrival

(d) Part of the Tent Sub Division of the 3rd Field Ambulance under Staff Surgeon Kenny arrived yesterday from Lemnos and are encamped with the 2nd Field Ambulance at Sq 169 X 4

From No 112 of 24/5 15

Sanitation

(f) In order to avoid contamination of springs and water supplies no burials are to be made within 200 yards of any water course or spring As far as possible burial places will be on the lowest parts of the water sheds

The bodies of animals will if possible be burnt or towed out and sunk in the sea

GENERAL ROUTINE ORDER BY GENERAL GOURAUD COMMANDING FRENCH EXPEDITIONARY FORCE

May 26th, 1915

Incineration of Turkish Clothes

111 On account of the danger of spreading infectious diseases which are rampant in the Turkish Army, all the belongings and equipment of Turkish

[illegible] not been [illegible] also of [illegible] for [illegible] possible [illegible]

It [illegible] for any [illegible] or kit which may have [illegible] soldier

[illegible]

8 All [illegible] supplies [illegible] Area are absolutely under the control [illegible] they are situated The [illegible] necessary in order to regulate [illegible] to put wire fences [illegible] with the O C Divisional [illegible] for that purpose [illegible] Commander Other [illegible] are to be warned that [illegible] R N Division must be signed by the [illegible] Staff

The Staff [illegible] arrange time tables for various [illegible]

The next large engagement took place [illegible] In preparation for this the G O C presided at a [illegible] of Commanding Officers on May 31 to discuss plans

On June 1 the 8th Army Corps [illegible] divisions viz the 29th Division (Regulars) the 42nd Division [illegible] Territorials) and the Royal Naval Division with General Hunter Weston as Corps Commander and Colonel Yarr previously the A D M S of the 29th Division now the Corps D D M S

On June 2 the Turks opened an intensive [illegible] attack evidently with the object of crippling the French [illegible] which had harassed the enemy persistently The Naval Division [illegible] dressing station came in for a large amount of this attack and one [illegible] of the medical unit had his head shattered by a common shell [illegible]

Mention has already been made of the [illegible] labour of mustering and accounting for all the medical stores of the Division True to the orders of the Medical Director General this work continued in spite of its difficulties and irksomeness Here again Casement proved his splendid loyalty and devotion to duty In all matters this officer was always ready to help and he showed such a clear headed grasp of his work and cool common sense in all difficulties that he not only endeared himself to every officer and man but also more than justified his selection as the D A D M S of the Royal Naval Division

In anticipation of the general attack about to take place on June 4 the A D M S and Casement made a detailed tour with the object of establishing an extra bearer post in the centre of the peninsula

A good situation in the Krithia Nullah between the headquarters of Brigadier General Frith and those of Brigadier General Lee of the East Lancashire Division answered the purpose (No 2 in following description)

On June 3, the A D M S took Fleming to this bearer post and instructed him to send the whole of his bearer division to this post Later in the [illegible] men before they had [illegible] ran being wounded [illegible] a bullet wound [illegible] which ended fatally [illegible] the Casualty Clearing Station

In Stewart's death we lost a very gallant and efficient officer

On Friday, June 4, the following four main channels of evacuation had been completed for the British wounded

(1) East side.—On the upper end of the nullah by the east or main Krithia Road a communicating trench led to the R N D advanced bearer post at "Brown House" which post lay within a few hundred yards of our three regimental aid posts situated in the trenches All the R A P s had been constructed as bullet proof, very efficient but necessarily small dug-outs

At the lower end of the nullah an advanced dressing station had been cut into the side of the hill

A mile further back stood our main dressing station in the olive grove and thence about two miles of road led to the Casualty Clearing Station on "W" beach

(2) In the centre a small track led up and ran on the west side of the Krithia nullah, in which nullah about 1½ to 1¾ miles from Krithia, we had established the above mentioned large bearer post consisting of the whole bearer division of our first field ambulance—120 strong Surgeon Adam took over command of this post

(3) On the West Krithia Road the Royal Naval Division had no medical posts, this line of evacuation being fully provided for by the 42nd and 29th Divisions

(4) West side —Here lay the large nullah leading down to Gulley Beach The Royal Naval Division held two tent sub divisions in reserve on Gulley Beach ready to be sent wherever necessary

As our sector of the line centred around the head of the nullah mentioned in (1) most of our medical arrangements had been concentrated on that line of evacuation, but as our reserves might have to reinforce the line to the westward it seemed advisable to supplement the number of bearers available from other field ambulances by the provision shown in (2) The vehicle difficulty had been overcome by making use of G S wagons from the Divisional train

The advance began at about 10 a m on June 4 and proceeded very successfully except at the French and on the right The French troops failed to advance and consequently the right wing of the Naval Division became exposed to a terrific enfilading from the enemy So heavy became our losses that we had to retire Heavy as were the casualties the medical arrangements never broke down Our bearers performed magnificent work not only for the Naval Division but also for the 42nd Division In our dressing stations work continued steadily and well, Surgeons Sewell Ellis and Devas, being especially noticeable for the thoroughness and skill they displayed in the care of the wounded The following reports from the Commanding Officers of the field ambulances and the S M Os of the brigades, give a good idea of this battle

Copy

MEDICAL REPORT OF ACTION ON 4TH JUNE, 1915

To A D M S

In accordance with instructions received on 3rd June I established a post for the Bearer Division of the First Field Ambulance on the Middle Krithia Road between Brigadier General Firth's and Brigadier General Lee's Headquarters Surgeon Stewart was Senior Medical Officer of Bearer Division but unfortunately [illegible] wounded on arrival at the post Surgeon Adam took his place the other [illegible] being Surgeon Lauderdale in charge of A Bearers and Surgeon [illegible] in charge of C Bearers

[illegible] the post was exposed to shrapnel and rifle fire a dug out capable of holding [illegible] cases was made and sand bagged on the top and on the sides A [illegible] for dressing slightly wounded cases The men took shelter [illegible] Communication was established between the R A P's of the [illegible] Royal Lancs, Fusiliers and Manchesters Comparatively few [illegible] in the forenoon of the 4th June but after 1 p m all the Bearer [illegible] kept busy that evening and night bringing in wounded from R A P's [illegible] from the trenches

[illegible] dressing, were treated at the Bearer post Some were [illegible] Several which arrived without identifica[illegible] written out and attached to patients

[illegible] on 4th and 5th by an ambulance and a G S wagon [illegible] R N D Headquarters during the day and advanced up to Bearer post [illegible] to W Beach Clearing Station

All officers and men worked extremely well under difficult and trying conditions Surgeon Adam is to be commended for his management of the Bearer post and the quick evacuation of the wounded Over 700 cases passed through this Bearer post

I regret to report that 11 men and 1 officer were wounded during this action

The Tent Division of the First Field Ambulance assisted the Third Field Ambulance in the dressing and evacuation of the wounded brought along the East Krithia Road

Surgeons H C Devas and T L Strudee worked very hard as the Tent Division was short of officers

I have the honour to be,
Sir,
Your obedient servant,
(Signed) A F Fleming
Staff Surgeon, R N
O C 1st Field Ambulance
R N Division

Copy

Fleet Surgeon Gaskell F R C S R N
A D M S
Royal Naval Division June 9th 1915

Sir

I have the honour to forward herewith reports received from the Medical officers of C Tent Sub Division and of A B and C Bearer Sub Divisions of the 2nd Field Ambulance who were on duty during the action June 4th, 1915 [illegible] all the statements in the [illegible] forward [illegible] upon the following officer —

Surgeon Humphrey [illegible]

This Officer has carried out all his duties [illegible] to duty. I am myself a witness of this. [illegible] attended to a wounded man under shell fire [illegible] being no witness to this deed but I am [illegible] ment. In forwarding these reports I would [illegible] especially —

S 3156 Actg Sergt S Ibbotson [illegible]
S 3433 Private P Lones
S 3202 " F Sterland C

Private Sterland was wounded in the performance of [illegible] and has since died.

I have the honour to be,
Sir
Your obedient Servant
(Signed) C E Corts [illegible]
Staff Surgeon [illegible]
O C [illegible] Field Ambulance

Copy

June 9th 1915

Report on the working and conduct of the Bearers of [illegible] Field Ambulance on June 4—7 1915

My section turned out for duty at 2 0 p m on June 4th and [illegible] until 5 0 a m on June 5th when they had a rest until 5 0 [illegible] until 6 0 p m the same evening.

It must be added that Section was on duty the previous night [illegible] 5 0 p m until 8 0 a m and was working from 4 0 a m [illegible] making a bomb proof at the Advance Post.

They returned at 8 45 to the Advanced Dressing Station [illegible] 2 0 p m June 4th and then commenced as stated above.

The section as a whole worked splendidly [illegible] up to command by Actg Sergt S Ibbotson and Actg Corporal W [illegible] is difficult in circumstances where men worked [illegible] to pick out individual men for mention [illegible] undermentioned —

Acting Sergt S Ibbotson S 3156
Private P Lones S 3133

These two went out to a very exposed spot and picked up [illegible] spite of orders from an executive officer that [illegible] patient, they rendered first aid and removed the [illegible]

Private Lones, also in addition to assisting [illegible] down by them carried down 4 cases on his back [illegible] the dressing station a distance of about one mile.

(Signed) [illegible]
[illegible]
[illegible]
[illegible]
[illegible]

June 9th 1915

To Staff [illegible]
O C [illegible]
[illegible] Naval [illegible] [illegible] 1915

Sir

I have th[illegible] dressing station 200 Hill [illegible]

In the [illegible] were completed and cases were [illegible] Roughly 300 cases were dressed at th[illegible] performed [illegible] ligation of anterior tibial and [illegible] Surgeon [illegible] and [illegible] well assisted The men attached to [illegible] on all [illegible] well although carrying on continuously [illegible] The Bearers o[illegible] B & C sections worked magni[illegible] the men of the Transport attached to the 2nd Field Ambulance under Capt [illegible] special mention for the work they performed in assisting the bearers

I have the honour to be,
Sir
Your obedient Servant,
(signed) Will A Sewell
Surgeon R N V R

[illegible]

To Staff Surgeon Stanford R N
O C 2nd Field Ambulance
Royal Naval Division June 8th, 1915

Sir

I have the honour to report on the work of the Bearers of my Sub Division during and after the action of June 4th [illegible]th

The work of the men was magnificent for over 20 hours they were carrying wounded continuously from the Regimental Aid Posts to the Dressing Station of the 2nd Field Ambulance a distance of fully a mile and a half

Most of the time they were carrying with only two men to a stretcher and although they were tired out they continued their work thinking only of the welfare of the wounded

They were exposed to the fire of "spent" bullets and had to carry patients over open areas often under shell fire

Among men who worked so well it is difficult to pick out any individuals without doing injustice to others but I should like to bring to your notice Sergt W Kelshaw who worked splendidly My other N C O s proved themselves worthy of their responsibilities

I should also like to bring to your notice Private W Clegg who very materially assisted me in my work of dealing with the wounded and also helped to carry stretchers The reinforcements who only joined up with me on June 4th worked extremely well although it was their first experience under fire

Unfortunately three of my men were wounded but I am glad to say none of them dangerously

I have the honour to be
Sir
Your obedient Servant
(signed) Humphrey Foxell
Surgeon R N
Bearer Sub Division, 2nd Field Ambulance
Royal Naval Division

To —
O C [illegible]
[illegible]

From —
C Sparrow, Surgeon
Hill, 200

Sir,

I have the honour to submit that I was evacuating wounded on the 4th June 1915 at the Brown House Advance Post. I had Section "C" Bearers and for some of the time Section "B" also.

They all worked very well in spite of the distance of transport and of the rifle fire going on at the time.

It is difficult to pick out one man more than another for mention but Corpl Wild and Privates Smith, Smellie and Stetland are deserving of all credit. The latter was wounded and I hear has since died. Private Jas. Hutton was also wounded.

The transport details attached to us acted as stretcher bearers and worked well.

Sergt Evans was a great help to me during the time.

(signed) C Sparrow,
Surgeon R N

Copy

Y Beach
June 9th, 1915.

Sir,

I have the honour to report that during the action of the fourth June the 3rd Field Ambulance was, as regards its Tent Sub Divisions, situated at point 168 Y 6 sheet 1 Gallipoli Peninsula, and the Bearer Sub Divisions were divided between this place, the Advanced Dressing Station situated about a mile along the East Krithia Road and a station about another mile beyond this where the Bearer Sub Divisions of the 2nd Field Ambulance were also placed, this last station forming a link between the Advanced Dressing Station and the Regimental Aid Posts. The Transport which worked between the Advanced Dressing Station and the Clearance Hospital at "W" Beach with halts at the Dressing Station consisted of 6 general service wagons lent by the Supply Train, two G S Wagons belonging to the 1st and 3rd Field Ambulances. For a part of the day two army horsed Ambulance Wagons were lent and three wheeled litters. Between the Advanced Dressing Station and the Regimental Aid Posts wounded were carried on stretchers only. It had previously been found that a G S wagon could be made to accommodate four stretcher cases and a few sitting cases according to the nature of their injuries and on the day in question this was carried out.

The work may be best described by dividing it into —1 That by the Bearer Sub Divisions.

At the Advanced Dressing Station Surgeon Creasy was placed and although the number of men with him varied somewhat during the day he had usually about two sections of bearers at his disposal and with these men he did excellent work in the collection of wounded from the Regimental Aid Posts, redressing wounds if necessary and placing the patients in wagons at the Advanced Dressing Station for transmission to the Dressing Station. The remaining bearers were engaged in conveying the wounded from the wagons to the tent and stone-built shelters at the Dressing Station where the Tent Sub Divisions were working and in escorting them to the Clearance Hospital at "W" Beach returning again promptly to the dressing station with wagons and stretchers after disposal of the wounded.

The latter part of the bearers work was superintended very ably by Surgeons Rivers and Shaw and the Chaplain the Rev P Hulkling also did all in his power to assist being always ready to convey orders, see that the wagons drew up [illegible] and so on Surgeon Shaw's [illegible] as it arrived, inspecting [illegible] moving him from the wagon to [illegible] [illegible] and particulars and [illegible] [illegible] wagons were properly [illegible] [illegible] manner Surgeon [illegible] [illegible] the arrival and departure [illegible] and considerate on [illegible] [illegible] work of this officer The rush [illegible] 1 30 [illegible] 2 30 a m on the 5th [illegible] what [illegible] and [illegible] the day [illegible] from [illegible] and remote parts [illegible] which [illegible]

[illegible] Surgeon [illegible] relieved Surgeon Creasy at the [illegible] a large shell burst in this station [illegible] fortunately inflicting only slight personal [illegible] assisted Surgeon Shaw in his work as [illegible]

[illegible] of the injuries being of a very severe [illegible] divisions worked hard to keep [illegible] were performed and every [illegible] them aseptic the cases supplied [illegible] the necessary notes and the [illegible] invaluable The cooks under the [illegible] kept a continuous supply of hot [illegible] the majority of the wounds were caused by [illegible] the wounded were again conveyed [illegible] The enemy fortunately did not [illegible] so that it was possible to [illegible] of placing wounded [illegible] to in the No 1 [illegible] and were awaiting trans[illegible] to note that not one of [illegible] Morphia was [illegible] administered [illegible]

[illegible] command and worked unde[illegible] who stood out pre[illegible] was required, and [illegible] Surgeon Taylor was always rea[illegible] everything that came to his [illegible] organize the scheme for the recep[illegible] of the [illegible] worked untiringly in a profess[illegible]

A[illegible] to duty were conspicuous in work [illegible] opportun[illegible] distinction They all did well and [illegible] and which you have approved will [illegible] been recognized I feel that to select [illegible] mention in this report would be [illegible] and although the names of a few [illegible] in their case also

I have the honour to be,

Sir

Your obedient Servant,

[illegible] Finch

Fleet Surgeon,

O C 3rd F A

To the A D M S
R N Division

Copy

[illegible] [illegible]
[illegible] Brigade A D M S
[illegible] and 6 the 1st [illegible] Brigade was in reserve [illegible] the *Drake* Battalion [illegible] supports
[illegible] 4th we moved up *Nelson*, *Hawke* and *Benbow* [illegible] other battalions went at first but the *Nelsons* went up [illegible] of the 42nd Division Here I was working in [illegible] Post of [illegible]
I [illegible] largely through East Lancs F A [illegible] (1) The bearers [illegible] Advanced Dressing Station at White House [illegible] working [illegible] keeping pace with the cases from that [illegible] and (2) [illegible] come out into the Gully [illegible] 300 yards [illegible] that [illegible] the White House [illegible] take them up there would have [illegible] stretcher [illegible] opposite directions along the Gully
I [illegible] with the M O of the R N Advanced Post and he [illegible] if I could [illegible] without him For this reason many *Nelsons*, some *Hawkes* and possibly [illegible] of other R N Battalions have gone through East Lancs F A
This [illegible] was quite unavoidable and much the best thing to do under the circumstances I wish to mention that Capt [illegible] Major [illegible] and Lieut [illegible] of the 6th and 8th [illegible] gave me every assistance My [illegible] worked splendidly and untiringly in getting out the wounded P O [illegible] organising them in a very able manner I have mentioned him to my C O for this reason [illegible] the whole of my band were very good
Surgeon [illegible] of the *Hawke* was wounded during the crossing of [illegible] before they reached the firing line I therefore did what I could to see that the stretcher [illegible] of the *Hawke* were in their right place Some of the *Hawke* wounded [illegible] communication trench through me and the East Lancs F A and others came down the R N D trenches and through the White House Advanced Post Surgeon Lauderdale when he arrived used the same aid post as Surgeon Playne
Surgeon Molesworth had a very difficult time in keeping in touch with his battalion which was continually [illegible] and getting lost I have not yet seen him to hear where he finally [illegible] established
Surgeon William [illegible] long way from me at the other end of the line in the aid post used by [illegible] and Surgeon Ballance on previous occasions
I can certainly say [illegible] battalion and I think for the whole brigade the evacuation went on quite [illegible] and efficiently though not in my case entirely through the correct channel
I consider that the R N [illegible] bearers compare very favourably indeed with those of other F A s I saw
I would also mention that my [illegible] duty men are doing very well at taking over any work that wants doing when the [illegible] cannot be used

(signed) H B Parker
Surgeon

9—6—15

Copy

From M O *Anson* Battalion
To Fleet Surgeon Gaskell R N
With regard to the medical aspect of the [illegible] of June 4th I have the honour to report that casualties commenced to filter into the aid post about noon and continued to come until 4 0 a m on [illegible]
During that time 99 cases were treated It was remarkable that a large proportion of stretcher cases were suffering from very large lacerated wounds The

[illegible] in wounds [illegible] but I have not [illegible] [illegible] violence of the [illegible] engagement though I [illegible] [illegible] [illegible] spilled [illegible] possessed

[illegible] walked into the [illegible] [illegible] none the worse for the wound [illegible] [illegible] were due to machine [illegible] [illegible] hands

[illegible] the Medical [illegible] duty to my entire satisfaction [illegible] [illegible] did well [illegible] to single out anyone [illegible] [illegible]

I would however take the opportunity [illegible] expressing my great admiration for the splendid work done by the [illegible] under Surgeon Mayne

(Signed) Alaric V Ballance

June 9th

([illegible])

To Fleet Surgeon Gaskell
A D M S

From Surgeon Meller M O *Plymouth* Battalion,
S M O R M L I Brigade

During the battle of the 4th June the Marine Brigade formed the Corps Reserve and the battalions did not move out of their rest camp

(Signed) R. M Meller
Temp Surgeon R N

From the foregoing reports it is seen that the work of the medical unit continued throughout the 5th and part of the 6th of June the casualties proving very numerous on both sides The enemy lost heavily and we took 450 prisoners

In our dressing stations enormous numbers of flies collected and caused much discomfort to the patients Consequently mosquito netting curtains suggested themselves as a necessary improvement for future occasions. The shelling of the advanced dressing station occurring as it did when our men had had a long period of very hard work and lack of sleep must have given them a shock though they in no way showed it

On June 6, the enemy kept up an intensive shelling of all our positions thus adding still more to our already large number of casualties. On this day a general shift round of our field ambulances took place, the third being sent to Gulley beach for a rest and the first moved into a new camp in the rear The accompanying rough map gives approximately the various posts and camps of the R N D medical unit at this period

As before stated our casualties were very heavy The recently arrived *Collingwoods* and *Benbows* lost so many men that they ceased to exist as separate battalions Surgeon Schuler being thus released became regimental medical officer of the *Howe* battalion Surgeon Crook returning to the Third field ambulance

On June 7 the Lowland brigade arrived and for administrative purposes (including medical administration) came under the Royal Naval Division On the following day one of the medical officers of this brigade (Major Taylor) being wounded, Surgeon Sievewright took his place


29 DIV
42 DIV
R/N DIV
DIV
FRENCH
CORPS

At this time [illegible] the [illegible] poison gas [illegible] tributed with [illegible]

On June [illegible] a veritable plague of [illegible] flies added [illegible] the enemy also increased his high explosive shelling and [illegible] casualties occurred every day in our rest camps. More effective [illegible] became necessary.

About the middle of June the War Office decided that commanding officers of field and [illegible] receive five shillings a day charge pay, [illegible] later this concession [illegible] to the R N D.

From every unit [illegible] the divisional General Officer Commanding received from time to time on a special form a list of names of officers and men submitted for mention in despatches and reward, the reasons being carefully [illegible] for bringing each name forward. Such lists for the medical [illegible] rendered by the A D M S. This proved a difficult and thankless [illegible]. A list would be rendered and would be returned with instructions to reduce it by perhaps 50 per cent, and eventually very few would [illegible] any mention at all. As these lists [illegible] necessarily confidential they [illegible] not be recorded in this history.

From this time onward no serious attempt was made to advance further towards Achi Baba and coincidentally with this disease increased alarmingly. The hot weather, the incessant shelling in all areas, the plague of flies and lice, the monotony of the dietary and above all the sense of [illegible] combined to make the men languid and "stale". Digestive troubles [illegible] prevalent, especially diarrhœa. On June 10 Surgeon Ballance of the [illegible] Battalion had to be placed on the sick list thoroughly exhausted [illegible] diarrhœa. These intestinal symptoms appeared to take a [illegible] among officers over 50 years years of age. As an illustration of this may be mentioned the fact that the Corps D D M S and the A D M S of every division except the Naval Division were at one and the same time prostrated with the malady.

Throughout the last six months of 1915 the work of the medical unit steadily increased. Depression and lethargy had to be fought, constant vigilance to minimize the pollution of the overcrowded peninsula, constant endeavours to locate and destroy the breeding places of flies and efforts to [illegible] the plague of lice gave the medical officers and their men [illegible] increasing work, both physical and mental. The monotony of the [illegible] has been referred to. Suggestions for remedying this were made by [illegible] A D M S and condensed milk was added to the ration. On June 13 [illegible] men of the *Deal* battalion, who had refused antityphoid inoculation [illegible] down with symptoms of enteric. Laboratory reports indicated that [illegible] of these cases of diarrhœa were more than diarrhœa. In short we [illegible] faced with the dread typhoids and dysenteries.

On June 1[illegible] [illegible] Mount and four days later Bradbury, returned to the peninsula with their wounds firmly healed. On June 20 Surgeon [illegible] received a severe shrapnel wound which proved fatal.

The first Field Ambulance dressing station in the nullah at the advanced side of Hill 138, under the able command of Staff Surgeon Fleming and the active co-operation of all his officers including Lieutenant Scammell the quartermaster, had become a model of efficiency. General Paris inspected the station and praised the work done there, which at this period chiefly consisted in the treatment of the sick of the Royal Naval Division collected from the trenches and the camps. Thenceforward this nullah became known as Fleming nullah.

On the night of June 18-19 we captured an enemy trench but lost it later by a bombing counter attack, our casualties being about a hundred. These wounds from bombs could almost always be easily recognized from their great severity. A similar occurrence took place about the end of June, the *Portsmouth* Battalion being the sufferers. These reverses had a depressing mental effect upon our already considerably debilitated officers and men. By the end of June the casualties of the Royal Naval Division amounted to roughly five thousand. The Turk had evidently received large supplies of shells at this time and every day his bombardment of us seemed to increase. Taube aeroplanes also flew over us two or three times a day and dropped bombs. The absence of protection from these latter made them especially terrifying.

The sanitary scheme mentioned earlier in this history had now started. Cresol and crude paraffin had arrived and a divisional sanitary party had been formed which cleaned up many particularly dirty spots in our area. Sanitation is, however, always a greater difficulty among irregulars than among regulars. The 29th Division never had as much trouble as the other divisions in impressing upon commanding officers of units their responsibility concerning sanitation.

During the first eleven days of July every one concentrated on preparation for a further great effort to break through the enemy. The medical unit introduced several innovations. All bearer officers toured the trenches noting the positions of the regimental aid posts and communication trenches. Red cross direction posts served to guide all and sundry to medical stations. A large supply of lemons had been procured from Greek bumboats for alleviating the dry mouths of the wounded in the dressing stations. Mosquito netting curtains screened the dressing stations from flies. Efforts continued (but alas in vain) to have our ambulance wagons landed. A rest camp had been formed in Imbros Island and many of our jaded troops had been greatly improved in mind and body by a short rest there away from shells, flies and filth and with more fresh food. On a storm which occurred during this period a gale on July 2 damaged the piers at W beach to such an extent that the usual departure of sick and wounded had to be delayed and some congestion occurred.

On July 5 the medical officer of the *Drake* battalion reported as follows concerning the morale of the men. The A D M S replied at once by field message and steps were at once taken

To [illegible] Gaskell A.D.M.S.
[illegible] Williamson [illegible]

[illegible] the last two weeks [illegible] Battalion suffering [illegible] the obvious symptoms [illegible] to a bursting shell [illegible] patients come comp[illegible] nervous [illegible] tuition and [illegible] number of similar [illegible] the symptoms [illegible] nervousness.

[illegible] to those cases [illegible] self thought to be suffering [illegible] reported to me by the officers [illegible] previously been [illegible]lly devoid of fear and ready [illegible] the most dangerous [illegible] have now degenerated into [illegible] they [illegible]en and cower down under [illegible] time to sleep. Several of these who were [illegible] by their officers as perfectly useless.

[illegible] of the cases of diarrhoea and vomiting which [illegible] due in the first place to an attack of nervous [illegible] 3 or 4 cases of sudden blindness through [illegible]. But the most striking case was that [illegible] to all appearances stone deaf and dumb. Th[illegible] rest camp. He was all right half an hour [illegible] shells had exploded anywhere near us. The officer [illegible] been a very good man and he had never noticed any [illegible].

[illegible] to write this report to you had I thought that [illegible] symptoms in the Battalion but I am convinced that [illegible] serious as to materially affect the efficiency of the [illegible] the subject with our O.C. (Lieut. Com. [illegible]) and [illegible] (Lieut. Com. Wells) and both agree that it is my duty [illegible] put [illegible].

Th[illegible] for ten weeks, during which time [illegible] has never been completely out of danger or out of earshot of the guns and though our [illegible] have been so heavy as those of some of the other Battalions [illegible] constantly employed on difficult and dangerous duties and have [illegible] deal of fighting. It remains to be seen whether the morale and [illegible] of the troops have been permanently affected. I think probably that complete rest and change would restore them. But [illegible] the [illegible] convinced that the condition is serious and calls for urgent attention. [illegible] of the Battalion is for the time being considerably below its normal standard, and unless something is done at once will be permanently lowered.

Regt. [illegible] (Signed) David J. Williamson
[illegible] M.O. *Drake*
5.7.1[illegible]

Copy

To.—Surgeon Williamson
N.M.S.[illegible] [illegible]

Reply to your letter concerning morale of *Drake* Battalion.
Your letter is [illegible] important. I have shown it to Lieut. Col. Richardson [illegible] states that you should [illegible] the original of this letter to your Commanding Officer [illegible] the copy which you have so done. A.A. I have [illegible] that your C.O. is reporting on the same subject and will find your letter [illegible] supplementing his own.
[illegible] A.D.M.S.
[illegible]

(*To be continued*)

Clinical and Practical Notes.

TWO CASES OF BRONCHIECTASIS.

By Surgeon Captain R. W. G. STEWART, O.B.E., M.B., D.P.H., R.N.

In the general discussion following Chevalier Jackson's opening paper on "Cases of Foreign Body in the Air and Food Passages" in the Section of Laryngology, &c., at the Annual Meeting of the British Medical Association, Bath 1925, Mr. G. Ewart Martin (Edinburgh) communicated the following interesting information on the use of the bronchoscope: "In Edinburgh during the last three years they had been interested in its use in the diagnosis and treatment of certain affections of the chest. That the bronchoscope could be used in diagnosis of conditions of the chest was not fully recognized.

They had been using it for diagnostic purposes, especially in a Ministry of Pensions hospital, among cases suffering from chronic chest affections. In the bronchoscope they had found a means of treating bronchiectasis and very satisfactory results had been obtained by lavage of the bronchiectatic cavities through the bronchoscope. Mr. Martin had been using the aspiration method suggested by Dr. Chevalier Jackson, with the addition of boric lavage, passing the suction bronchoscope down to the mouth of the cavity; through this a two way cannula was passed into the cavity, aspirating with the suction pump. After that boric solution was injected through the second cannula and the cavity then washed out.

"In some of the cases he had finished by painting the cavity with absolute alcohol. By this means there was set up a slight irritation of the cavity walls which tended to their adhesion. At the same time a spasm of coughing was set up and this ensured that no purulent secretion was left above in the bronchus. Bronchial lavage was preferably carried out under a local anaesthetic. In this form of treatment there was a hope of benefiting those bronchiectatic cases which in the past had gone on for long periods a nuisance to themselves and to their friends in their continual coughing and unpleasant breath.

"With the use of a distal lighted bronchoscope and the examination so easily made a means was offered of diagnosing and treating conditions of the chest which in the past were left untreated and only theoretically diagnosed."

In this connection the following case is of interest. H. O., aged 32, was admitted into Royal Naval Hospital, Plymouth, on September 11, 19[illegible], with the following history: About four weeks previous he contracted a severe chill and was sick on shore from August 26 to September 9 under the care of a civil practitioner. This illness was characterized by attacks of severe pain in left chest, violent paroxysms of coughing, expectoration of blood clots, [illegible] of temperature to 101° or 102° F., and profuse night sweats. These pyrexial attacks alternated with periods of almost complete freedom from symptoms during which patient was able to be up and walking about. He returned to duty on September 9, but again reported sick two days later with a temperature of 103.[illegible]° F., and was discharged to hospital.

On admission temperature was 103.6° F. Pulse 112. Respirations 38. No marked respiratory distress. Cough frequent and accompanied by marked foetor of the breath. Sputum purulent, bloodstained and very offensive. Coughing caused severe pain in the left chest above the nipple line. Expansion of left side of chest was defective. On percussion there was dulness over the upper part of left lower lobe. Breath sounds were impaired, V.R. and V.F. [illegible] rales and rhonchi [illegible] audible over this area. Over the upper part of left chest in front the percussion note was impaired, breath sounds were bronchial in character, and V.R. and V.F. greatly increased. Puncture through the fifth left intercostal space [illegible] axillary line yielded air and a small quantity of serous fluid. Culture showed no growth after twenty-four hours. The right chest appeared to be healthy.

On September [illegible] he had a small hæmoptysis (2 oz.) and a larger one (8 oz.) the following day. This continued for about a week in gradually diminishing quantity. Cough was very troublesome at times, severe paroxysms being induced by change of posture and accompanied by profuse purulent expectoration of [illegible] and [illegible] fœtid odour.

X-ray examination of left chest on October 10 showed general loss of translucency and lack of expansion of the left lung, also an area of complete opacity in the region of the interlobar fissure. The sputum was examined for T.B. on numerous occasions with negative result. Elastic fibres were frequently demonstrated. Attacks of hæmoptysis lasting from one to several days occurred during the succeeding seven months. The hæmorrhage varied in amount from [illegible] to several [illegible] and was usually accompanied by severe paroxysms of coughing, marked [illegible] and copious expectoration of dark coloured sputum [illegible]. Between these attacks the cough became less frequent, sputum diminished in amount, fœtor of breath almost disappeared and patient felt better generally. During April and May, 192[illegible], hæmoptysis was more [illegible] and copious than heretofore and symptoms considerably aggravated. [illegible] little improvement set in, cough diminished, sputum became scanty and [illegible] occasionally showed a trace of blood.

On [illegible] X-ray examination showed that the general loss of translucency of left lung had increased and the dense shadow previously reported was still present. During the course of this illness clubbing of the fingers of drum-stick character became very pronounced. A noteworthy sign on auscultation was the presence of [illegible] in the aortic area which was transmitted outwards towards the [illegible] and along the left border of sternum. An aneurysm was [illegible] but there was no evidence of such on X-ray examination. On July 21 he was discharged from hospital [illegible]. Cough was then infrequent and [illegible]. He had increased in weight from 10 st. 6 lb. (on admission) to [illegible] and his general condition was much improved, but he was incapable of any exertion.

Subsequent History.—Patient was admitted into Edinburgh Royal Infirmary in August 192[illegible] under the care of Mr. G. Lovett Martin, who has kindly furnished the following [illegible]:—

September 10, 192[illegible]. He came in to hospital about three weeks ago, and we had him [illegible] and found, as you had previously found, that the upper lobe of the left lung was [illegible] but the upper part of the lower lobe was dull, though the lower part was apparently healthy. There seemed to be a thickening in the region of the left auricle of the heart. The physician's report was that the bronchiectasis was due to some internal pressure, *e.g.*, a tumour or an aneurysm. I examined him with the bronchoscope under local anæsthetic. He was a [illegible] patient. The right bronchus showed a good deal of frothy secretion. The left bronchus was difficult to enter. There seemed to be something bulging out, pushing the bronchus upwards. I took it to be an enlargement of the left auricle of the heart. There was no pulsation and no sign of an aneurysm. Beyond the [illegible] bifurcation of the bronchus the inner branch was found [illegible] and pus bulging out of it, the cavity extending to about one inch being located. The pus was sucked out and cleared with spirit. Seven days later I again passed the bronchoscope; on this occasion the right side was clear. The left cavity was [illegible] and the pus not nearly so profuse. On the second examination [illegible] the bulging in the bronchus such as was seen on the pr[illegible] At the close of the second examination I insufflated the left [illegible] late and had an x-ray taken. There is no sign of [illegible] and the entrance to the left bronchus seems now quite free. He [illegible] at Home at present and is to return in three weeks [illegible] wash out the cavity.

His [illegible] condition generally has much improved and he feels in himself much better. I think he is going to stay in the district for some time so that we can wash him out [illegible] to time. I am inclined to think that the condition is the result of the [illegible]ment of the left auricle.

"November 4, 1925. For the last three weeks patient has had practically no expectoration. Following the last examination he over-did things a bit and had a slight haemorrhage evidently from the granulation, but when this cleared up the foul odour disappeared. Examination with the bronchoscope shows that the cavity has shrunk and the mucous membrane is practically healthy. There is no pus to be seen on that side at all. He is feeling and looking very well.

November 30, 1925. H. O. has done extremely well. He has been washed out four times. We passed the bronchoscope down into the cavity sucking the cavity as dry as possible. Down the inside of the bronchoscope is passed the double cannula right down to the foot of the cavity. One side of the cannula is sucking any pus out of the cavity while with the other part we pump in from 6 to 10 c.c. of boracic lotion thus washing out the cavity. After this the cavity is dried thoroughly by swabbing and painting with absolute alcohol. H. O. now weighs over 11 st. 6 lb. which is above his normal weight. He feels extremely fit and has had no coughing for five weeks.

I sent him to Dr. H. J. Hervat for examination, who reports as follows:—

> I saw your patient H. O. yesterday. His general condition of course is excellent. Physical examination shows a little retraction below the left clavicle with impaired percussion note, bronchial breathing and increased vocal resonance. I could hear no moisture in this area. In the left infra-axillary region the breathing was bronchial in type with an occasional crepitation at the top of full inspiration. The bases of his lungs are clear and his heart condition is satisfactory.
>
> I see no occasion for further bronchoscopic treatment at present.

On October 30 [illegible], prior to the last two examinations, patient writes as follows: "It (i.e. bronchoscopy) is not a bad show at all, the worst part being to get one's head into position. Apparently I have a pretty strong lower jaw which gave some trouble the first time, however he soon tired me out and inserted the tube. The whole process of washing out the cavity, &c., only lasts about ten to fifteen minutes and apart from a sore throat for a couple of days leaves no ill effects.

One is unable to stop coughing from the time he starts until two or three hours after he has finished.

Am still bringing up a certain amount of blood at times but simply sit still for about half an hour and then forget all about it, and go for a quiet walk up to three to four miles.

The results as you will see when I return are wonderful."

The following case is of interest on account of the septic complications:—

H. L., aged 1[illegible], had an attack of pneumonia in December, 1924. From May 17 to 25, 1925, he was under treatment for catarrh and was again placed on the sick list on June 10, suffering from severe pain in right chest, general malaise, pyrexia and cough with purulent expectoration.

On admission to hospital temperature was 101·[illegible] F. Pulse rate 96. Respirations 18. Pain was referred to the right chest over an area 3 in. by 2 in. below [illegible] to the [illegible] of nipple. It was more or less constant [illegible] increased in [illegible] by coughing and inspiration. There was marked dulness on percussion [illegible] the axillary line below the level of the nipple and [illegible] loss of [illegible] particularly at the base. Over this area there was a diminution of V.R. and V.F. and weak breath sounds. A pleuritic rub was detected in the [illegible]. Râles and rhonchi [illegible] audible over the whole of right chest. [illegible] of a paroxysmal character [illegible] accompanied by copious expectoration [illegible] foul smelling sputum containing cocci and bacilli. No T.B. or elastic fibres were demonstrated. X-ray examination showed a deep shadow in the region of the right middle lobe.

Progress of Case. Paroxysmal cough with profuse purulent fœtid expectoration persisted and severe pyrexial attacks alternated with periods of apyrexia. Hæmoptysis occurred on several occasions but was never severe.

Further X-ray examination in August showed the presence of a large shadow in the right lung, the densest portion being near the lower end of the hilus [illegible] out towards the periphery. Numerous specimens of sputum examined were found to be teeming with spirochaetes resembling *S. refringens* type. [illegible] negative diplococci and bacilli were also present. On October 24 patient [illegible] ill and complained of severe throbbing pain in the lower end of right [illegible] which became greatly swollen and brawny. There was marked tender[illegible] the radius about the junction of its middle and lower third. Leucocyte [illegible] was 9,625 per c.mm. On October 25 an incision was made over the [illegible] aspect of external border of radius and a small quantity of pus evacuated [illegible] beneath the periosteum. The following day temperature was 103.4° pulse [illegible] foul pus was discharging from the wound.

No growth on culture of pus was obtained either under aerobic or anaerobic [illegible]. The œdema increased and spread further up the forearm and the [illegible] of fœtid pus became profuse. Several counter incisions were made [illegible] by a diminution of the œdema and severity of the pain, but his general [illegible] cause for much anxiety. On November 12 he was incoherent, [illegible] and drowsy but could be roused and answered questions intelligently. Drowsiness and apathy increased, he rapidly became unconscious and death took place on November 14.

Post-mortem Examination.

Lungs. Dense adhesions at the right base. Pleura and lung firmly adherent to chest wall and diaphragm. Base of right lung (especially anteriorly) tough [illegible] and fibrous. Bronchioles thickened and bronchiectasis present in places, [illegible] cavities varying in size the largest being about ¾ in. diameter and con[illegible] purulent material. Left lung somewhat congested at the base. Compensatory emphysema marked.

Brain. On removing the skull cap and dura mater, pus was seen in leptomeninges between the convolutions of the right hemisphere. There was a patch [illegible] discoloured brain matter over the left frontal lobe with perceptible softening beneath. On removal of the brain this area gave way, and a quantity of offensive green pus escaped from a large abscess cavity with thickened wall (not recent) in the left frontal lobe. There was a small amount of purulent fluid in the left lateral ventricle but the abscess cavity did not communicate with it. Pus was also present in the leptomeninges over the cerebellum at the base of the brain.

A CASE OF PURULENT PERICARDITIS

By Surgeon Captain F H NIMMO M V O R N

AND

Surgeon Lieutenant Commander Wm I GERRARD M D, M R C P D T M H R N

In the January, 1926 number of the *Journal of the Royal Naval Medical Service* Surgeon Commander Adshead gives an interesting account of a case of purulent pericarditis treated surgically in R N Hospital Hong Kong As a matter of interest in the prognosis of the case the following brief notes are given —

The patient W U, aged 23 was admitted to R N Hospital Haslar on December 1, 1925 as a foreign invalid via R N Hospital Plymouth From perusal of the history of the case it was evident that the patient had made a wonderful recovery

Condition on admission Patient's general condition was very good Subjective symptoms were shortness of breath on exertion and occasional pains of a stabbing character over the cardiac region

Cardiac condition—marked apical systolic retraction apex fixed area of cardiac dulness increased

Blood pressure—S P	140 mm	Hg
D P	85	,,
P P	55	,,

X ray examination by Surgeon Commander Hastings revealed a general enlargement of the heart in all diameters position more horizontal than normal and distortion present due to apical pericardial adhesions

Respiratory system—limited movement and impaired air entry at base of left lung

Patient has been invalided from H M Service

A CASE OF ACUTE CINCHONISM

By Surgeon Commander C P ADSHEAD M B R N

The following case is recorded, not for the purpose of adding to the knowledge of the symptomatology or treatment of quinine poisoning but to serve as a warning to those whose experience of the treatment of malarial fever has been gained haphazard by an occasional case and treatment carried out without theoretical knowledge or practical experience of the necessary dosages of quinine a drug to which real dangers are attached

A B aged 26 was admitted to hospital at 8 45 p m on October 27 having developed complete blindness two hours previously

His history was that on October 23 following five days of intermittent pyrexia benign tertian malarial parasites were found in the peripheral blood Quinine sulphate 20 gr and potassium bromide 20 gr were prescribed four hourly on the 23rd and 24th and on the 25th lowered to three times a day It is thus estimated that prior to admission at a minimum he had taken by the mouth 200 gr of quinine sulphate and 200 gr of potassium bromide

On admission his temperature was 100 4 F pulse 120 respirations 20 He was mentally very excited but not delirious answering all questions brightly and quickly He complained of total blindness no perception of light or objects but had sensations of "jazz lights" at intervals Hearing was only slightly impaired [illegible] headache The tongue was very [illegible] stated that he had [illegible] sleep for a week latterly on account [illegible]

The pupils [illegible] dilated and reacted to strong light [illegible]

On ophthalmoscopy the media were clear both optic [illegible] retinal vessels [illegible] small and contracted and there was no evidence [illegible]

It [illegible] external auditory canals contained cerumen but the left tympanic membrane was seen and was anatomical

The peripheral blood contained a few benign tertian parasites

Progress.—On the 26th after a restless night with much diarrhoea, he could perceive light with both eyes The stools contained blood and mucus and the diarrhoea continued during the day In the evening he could see objects dimly but was not encouraged to use his eyes Ophthalmoscopy showed no recovery in the condition of the fundi

On the 27th after another restless night with some delirium and diarrhoea [illegible] was rational and stated that he could see fingers and more distant objects The pupils were reacting more briskly to light By the evening he was [illegible] and had incontinence of faeces Temperature 102° F, pulse 120

On the 28th he was semi comatose with incontinence of faeces and urine The [illegible] was more profuse but no longer contained blood By the afternoon he [illegible] rational but still incontinent On ophthalmoscopy both discs were now [illegible] choked and the retinal vessels dilated

On the 29th after a fair night with occasional incontinence, he was more [illegible] He was however very lethargic, answering questions very slowly and [illegible] with difficulty He had the appearance of suffering from encephalitis [illegible] the evening he was quite rational stating that he felt much better, but [illegible] of pain behind the left side of the jaw

On the 30th he was lethargic but rational The vision was slowly increasing [illegible] incontinence was lessening and finally ceased on this day

His previous condition now became complicated by an unexpected lesion [illegible] is not considered to be part of his poisoning but caused by the [illegible] condition of his mouth throughout his illness He developed a large [illegible] abscess which formed quickly, closing the jaws and causing much [illegible] swelling On November 2 this abscess was opened under twilight [illegible] a large quantity of pus evacuated the pus also burst through the skin [illegible] external auditory canal and counter drained by the ear Pyrexia, which [illegible] formation of the parotid abscess had been negligible now subsided [illegible] convalescence commenced

Cerebral and abdominal symptoms disappeared and constitutional recovery was rapid Although since admission no further antimalarial drugs had been employed the peripheral blood was negative to malarial parasites

The vision became subjectively normal except that for a long period he stated that he had the sensation of always being in the twilight This latter symptom passed away

Prior to his discharge to duty on December 1 his objective and colour visions were physiological and of high standard

Treatment throughout was symptomatic Digitalis and strychnine were given by the mouth until the development of the choked discs, when sodium salicylate was employed for a short period The enteritis was treated by bismuth and [illegible] was assisted by syrupus ferri phosphatis co

The are few drugs which are administered or self administered in such varying dosages as quinine given for malarial fever The Great War brought large numbers of medical men into contact with this disease many of them with [illegible] previous experience of the disease or laboratory knowledge of the life cycle of the different parasites their clinical significance or the treatments required The necessity of evacuating their sick into hospitals prevented all but a few from gaining this knowledge oral treatment must be regarded only as a temporary measure

My conversations with brother medical officers lead me to form the opinion that quinine is often administered in unnecessarily large and dangerous doses. Both curative and prophylactic administration is often at the patient's own discretion. Many such self treated cases are not malaria. Happily these people are usually content with the subsidence of symptoms stop taking quinine and thus escape toxic poisoning though if really suffering from malaria they are courting chronicity

The subject of prophylactic treatment and the occasional resulting chronic quinine poisoning will not be discussed but in this treatment also many grave errors are committed

Most of our cases of malarial fever in H M Navy are primary infections and if not such are distinct fresh infections who have been cured of their previous attack. These cases do not need large doses of quinine for cure if the drug is properly administered and continued over recognized periods. If such reasonable doses as 15 gr by the mouth three times a day do not lead to the rapid disappearance of all clinical symptoms the drug is being administered improperly in consistency or time and is not being absorbed. In patients intolerant to quinine by the mouth or where rapid action is desired on account of serious symptoms in these days of varied salts of quinine and the safe administration by this method intravenous injection should be resorted to

Massive doses at the outset without knowledge of the tolerance of the patient or his susceptibility to absorption, are highly dangerous. Our case of acute cinchonism is illustrative of this danger

Chronic malaria is rare in H M Navy. Reinfections are at long intervals due to the nature of our service and the constant change of environment and orientation. During the past six years service on the China station, three years of which have been in hospital employment I cannot recall one case with return of symptoms following treatment. My experience was similar when serving afloat and ashore on the Mediterranean, East Indies and West Indian stations. In common with others however, I have frequently come across cases who diagnose themselves as having a "touch of my old malaria". Such self made diagnoses are usually found to be unsustainable in basis and to have their true cause in dietary indiscretion or some other disease or are made as a convenient excuse for escaping undesired social engagements or unpleasant duties

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TWO USEFUL METHODS OF TREATMENT IN SKIN DISEASE

By Surgeon Commander H B B HULL R N

(1) *Treatment with Alkalies* —This method was brought to my notice by Mr Cummins Doble in his most interesting article in the *Lancet* 1925 vol ccviii, No 5293. He found that patients suffering from seborrhoea, seborrhoeic eczema, prickly heat carbuncles abscesses boils &c, had an abnormally high pH value of the urine

By giving alkalies until the pH value of the urine became normal these skin conditions were cleared up. His prescription is —

R	Sod. bicarb	30 gr
	Pot bicarb	25
	Pot cit	20
	Tinct card co	30 min
	Aq menth pip ad	1 oz

This is [illegible] three times a day between meals, decreasing [illegible] the dose according to the pH value of the urine. I have found this [illegible] useful, especially in those cases which have resisted other forms of [illegible]. In a [illegible] where one cannot get the pH value of the urine estimated [illegible] continue until the treatment until the urine is alkaline to litmus. This [illegible] be tested [illegible] thing in the morning and last thing at night to avoid the [illegible]. Some [illegible] have an enormous alkali tolerance, so that very large [illegible] be given before the pH value can be brought to normal; in others quite moderate doses are [illegible].

The pH value of the sweat of the palm of the hand [illegible] taken; an apparatus called a capillator is sold for this purpose.

(2) *Whole Blood Injection.*—Here surely is an ideal form of [illegible]. It costs nothing, the patient brings it with him and it can be given anywhere so long as you have a syringe and a needle. You simply take [illegible] of blood from the patient's vein and, before it has time to clot, inject it into the buttock. I have no doubt that the same result could be obtained by [illegible] giving the patient a hæmatoma of the buttock, but the former method is more scientific and avoids legal proceedings. Many of us have seen skin lesions which clear up after an injury or an accident.

A second injection of 10 c.c. can be given five days after the first, and they can be continued at five-day intervals if necessary. As an alternative, peptone may be injected. This must be a reliable brand [illegible] histamine-free. I have been using [illegible] sterile peptone 5 per cent supplied by Martindale. This is given by slow intravenous injections every fourth day. The idea is to desensitize the patient who is being sensitized to some protein. Blood seems to be the best in acute conditions, peptone in chronic ones.

I have seen excellent results in urticaria, seborrhœa, seborrhœic eczemas, dermatitis due to irritants, and chronic skin conditions generally where the patient is sensitized. Whole blood seems to be especially useful in dermatitis following the sulphur treatment of scabies, in acute seborrhœas, indeed in any acute inflammatory condition of the skin.

There is no reaction, so that it cannot be a true protein shock.

There is much work yet to be done in connection with these treatments, but they present a most fascinating study. The possibilities of the significance of the pH value of the urine seem boundless. It has even been suggested that a man's politics depend upon his urine's pH value!

CASE OF EXTENSIVE COMPOUND DEPRESSED AND COMMINUTED FRACTURE OF SKULL

By Surgeon Commander W. L. ROBERTS, R.A.N.

The following case seems worthy of record as recovery after such extensive [illegible] is rare.

The patient, a boy aged 4½ years, the son of a Chief Petty Officer, was [illegible] to the hospital at Flinders Naval Depot, Victoria, at [illegible] on March 19, 19[illegible].

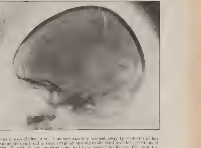
History.—He had been playing in his garden with his young sister at Bittern, [illegible] miles distant from the depot, and was found lying unconscious with blood [illegible] from the left side of his head. Although the accident was not seen, it [illegible] that the boy had been kicked by a horse which had strayed in [illegible] the fence.

[illegible] on Arrival.—Semi-conscious. Pupils widely dilated. Skin clammy. [illegible] rapid, thready, rate 140. Temperature subnormal. Respirations 26.

[illegible] *Examination* [illegible] a jagged vertical wound [illegible] [illegible] behind the left external [illegible] [illegible] the whole of the parietal [illegible] on the left side [illegible] Gentle palpation [illegible] [illegible] depression [illegible]

[illegible] was rapidly prepared for operation which [illegible] after arrival [illegible] respiration was becoming difficult.

[illegible] —Under light ether (open) anaesthesia administered [illegible] [illegible] and assisted by Surgeon Lieutenant Lockwood [illegible] a large horseshoe shaped flap to expose involved area. [illegible] was found than external appearances indicated. The first thing [illegible]



was a mass of blood clot. This was carefully washed away [illegible] of hot saline (normal) and a large irregular opening in the skull revealed [illegible] of the left parietal and temporal bone had been pushed bodily [illegible] from the [illegible] being stripped off in the process and the largest fragment [illegible] which had been driven in at right angles could [illegible] through [illegible] the torn dura mater.

The smaller fragments (four in number) were removed first and the [illegible] the dura [illegible] enlarged. Through this the larger fragment was [illegible] drawn being followed on exit by a gush of brain substance. The whole [illegible] now well irrigated with hot saline and the opening in the dura mater closed except for a small gap for drainage; this corresponded with the original scalp wound which was enlarged. No tubing was used. The flap was then replaced and fixed in p[illegible] [illegible] saline [illegible] inserted at intervals of $\frac{1}{2}$ in. Time occupied two [illegible]. Patient [illegible] and breathing improved immediately the large fragment of bone was removed.

Condition on return to ward.—Temperature 97.6° F. Pulse 124. Respiration 28. Colour improving. Child lay semi-conscious until evening when he took sips of milk. He vomited at 11.30 p.m. and dressing was changed on account of hæmorrhage. Was inclined to be restless; given Dover's powder 3 gr. Rectal saline 6 oz. administered.

March 20.—Temperature 98° F. Pulse 120. Respirations 18. Colour fair; breathing more natural. Pulse volume and tension, moderate. There was complete flaccid paralysis of right side with absent reflexes, and loss of sensation and speech.

Progress.—Stitches were removed on March 26. There was some protrusion of brain substance through the drainage opening during the first week. This was later replaced by granulation tissue. On this date patient moved his right leg and muscles of right lower extremities became spastic. Reflexes right leg increased and Babinski present. The remaining muscles on the right side were still in a flaccid state.

March 30.—Moved his right arm.

April [illegible].—Was able to chew on right side of mouth, and made attempts to speak. From the first week daily massage of muscles was carried out.

April 11.—Allowed up, and walked with assistance. Gait somewhat stiff.

April 25.—Speech returned, rather indistinct but definite. Discharged from hospital.

May 5.—Walking without assistance and speaking clearly. There was little [illegible] wasting. Granulation tissue practically all disappeared. Area of wound [illegible], but no hernia cerebri.

The accompanying skiagram taken by S.B.C.P.O. J. Levy shows plainly the [illegible] damage to skull.

A CASE OF GASTRIC ULCER

[illegible] H. T. B. STEPHENS, O.B.E., M.B., F.R.C.S., D.P.H., R.N.

A [illegible], aged 27, was admitted to the Royal Naval Hospital Haslar on [illegible] suffering from chronic gastric ulcer. His previous medical [illegible] was that the ulcer had perforated on January 23, 1924. The perforation had been closed successfully by operation, but he had suffered from dyspepsia [illegible] June 24, 1924, the appendix had been removed.

[illegible] on the case was very thin and anæmic, with the peculiar sallow [illegible] characteristic of chronic toxæmia. Physical signs showed a definite [illegible] hyperæsthesia above and to the left of the umbilicus; to the left of the [illegible] the epigastrium deep pressure elicited tenderness.

The [illegible] report dated October 7, 192[illegible], stated, "There is gross deformity of [illegible] of the stomach of an hour-glass character together with well [illegible]. The appearance suggests gross ulceration, possibly [illegible] with adhesions and partial obstruction of the third [illegible] by the latter. The stomach was empty six hours after a [illegible] except for a fleck in the region of the pylorus."

Laparotomy was performed on October 14. On account of the technical difficulties [illegible] the steps of the operation are described in detail.

A [illegible] incision was made to the left of the middle line and the left rectus [illegible] outwards. On opening the peritoneal cavity inspection and palpation revealed that the pyloric portion of the stomach was fixed by strong [illegible] above to the liver, behind to the pancreas, in front to the anterior abdominal wall In addition the whole of the great omentum was bound to the parietal peritoneum The latter was set free first and brought out of the wound in order to identify the jejunum Owing to the immobility and high situation of the stomach posterior gastro-jejunostomy was rendered impracticable It was then decided that partial gastrectomy alone could afford relief

The first part of the duodenum was mobilized freely by breaking down and dividing stout adhesions Two clamps were then placed in position, the intervening part was divided with a cautery knife and the distal end invaginated The right gastro-epiploic and pyloric arteries were secured and divided between ligatures. The greater curvature was freed and the vessels ligatured for a distance of 4 in The lesser curvature was practically cut away from the inferior surface of the liver as no gastro-hepatic omentum remained This separation became a difficult and tedious process in the course of which the liver was wounded in two places It was now evident that the induration of the lesser curvature extended to within an inch of the cardiac orifice The posterior surface of the stomach remained matted to the pancreas This was slowly separated care being taken not to injure the middle colic vessels At one point separation was impossible owing to the cartilaginous density of the ulcerated area Rather than damage the structures forming the stomach bed, a slice of fibrous tissue was cut away which left a hole the size of a sixpenny bit in the posterior wall of the stomach Finally, the stomach was mobilized but the coronary artery remained to be ligatured This could only be found by palpation after drawing the stomach forwards and to the left A stout ligature was passed round it by means of an aneurysm needle, and it was thus secured The greater part of the body and the whole of the pyloric part of the stomach were then excised by the cautery knife The cut ends of the proximal part were inverted and closed with a triple layer of linen sutures The final step consisted in performing a posterior gastro-jejunostomy with what was left of the stomach Considerable oozing took place from the cut surfaces but the abdomen was closed without drainage

After treatment consisted of rectal salines with glucose four hourly for thirty six hours From then onward fluids were given freely by the mouth The patient has had no vomiting since the operation The secondary anaemia was severe but recovery was rapid

October 30	3 600 000 reds per c mm
November 6	3 700 000
November 19	1 000 000

A steady increase in weight was also noted

November 3	8 st [illegible] lb
November 10	8 st 10 lb
November 30	9 st 1 lb

On November 30 the patient was placed on full diet, substituting fish or fowl for red meat On December 5 he was discharged to twenty eight days' sick leave and recommended for three months' light duty This case is recorded as an example of a man being returned to light duty after a major operation of extreme severity instead of being invalided from the Service

The laboratory report on the ulcer stated that the lesion was a simple chronic inflammation

A CASE OF ERYSIPELAS OF THE LACRYMAL [illegible]

By [illegible] E L ATKINSON D.S.O. A.M. [illegible]

H[illegible]—[illegible] W [illegible] aged [illegible] reported sick with a swelling [illegible] the [illegible] maxilla extending to the corner of the [illegible] [illegible] in the nose and an abscess was [illegible] lacrymal sac

He states [illegible] started as an itching and pain in the region of the inner canthus [illegible] days ago

On [illegible] November 11 1925—A fluctuating swelling was seen on the inner side of the [illegible] Temperature 100 F [illegible] pulse 84

First Operation November 11 1925—A vertical incision was made along the sac the contents [illegible] pressure spurted a fair distance The sac was [illegible] The swelling subsided somewhat for a few [illegible] great swelling and a dome still remained [illegible] for six days before settling to normal

On November [illegible] the swelling again increased with local redness tenderness and [illegible] The right eye showed conjunctivitis and the eyelids [illegible] Temperature 100·4° F pulse 72

Second Operation [illegible] an incision into the upper lid was made and quantity of [illegible] evacuated

A CASE OF CONGENITAL ABSENCE OF RETINAL PIGMENT

By Surgeon Commander E L ATKINSON D.S.O. A.M. R.N.

History—[illegible] aged [illegible] stoker was sent to Haslar with diagnosis [illegible] He [illegible] complaining of a feeling of a foreign body in his left [illegible] some days [illegible] He also complained of a marked blurring of [illegible] from the dark engine room into a bright light, which takes [illegible] to [illegible]

On [illegible]—Vision hyperacute R.E. [illegible] L.E. [illegible] N.V.D. = 0·3 both [illegible]

Ophthalmoscopic examination revealed a lack of the normal pigment in [illegible] the disc and retina on the left side [illegible] instead of red This led to retinal irritation, giving rise to the [illegible] foreign body in the left eye

BLOWN TINS AN EXCEPTIONAL CASE

By Surgeon Commander T B SHAW M.B. R.N.

AND

R C FREDERICK Esq

In the examination of tinned articles for human consumption it has long been [illegible] blown this provided definite evidence that its contents [illegible] It is desirable to draw attention to an exception to this rule [illegible] of the substance referred to below may be condemned though [illegible] quite satisfactory The blowing of a tin is as a rule readily [illegible] the distended ends and the characteristic sound produced when [illegible] the finger In doubtful cases the condition can be easily [illegible] the tin under water

[illegible] using pure coffee on a large scale purchased it roasted and [illegible] to preserve the aroma and keeping qualities, the coffee merchants were [illegible] quired to [illegible] level [illegible] mediately after [illegible] ceased [illegible] but occas[illegible] [illegible] root were blown [illegible] type [illegible] designed [illegible] light, was introd[illegible] few [illegible] of pack[illegible] blown. This also happened [illegible] subsequent [illegible].

[illegible] of coffee about 100 [illegible] discharged [illegible] the pressure displac[illegible]. On analysis the [illegible] were found to have [illegible] composition:

Carbon [illegible]	15.6 per cent
Oxygen	6.1 —
Nitrogen [illegible]	18.3

The coffee itself [illegible]. Here [illegible] production of these gases is [illegible] between freshly ground [illegible] the air with which it is in contact. The reaction is similar [illegible] occur with damp vegetable matter such as tobacco, hay [illegible] described by Frederick in the *Journal of Hy[illegible]* [illegible] research, however, it was found that the presence [illegible] no stero[illegible] essential condition of the reaction [illegible] finding, that it may occur between air and freshly ground coffee with [illegible] content in the neighbourhood of only 1 per cent.

Surgical Notes.

SEPTICÆMIA

By Surgeon Commander L. Warren, O.B.E., M.B., R.N.

In the *Lancet* of January 23, 1926, Professor L. S. Dudgeon described the treatment of acute bacterial infections by intravenous injections of perchloride of mercury and mercurochrome.

Before giving details of his method, however, it may be useful to recapitulate the chief points brought out in a discussion on the treatment of septicæmia which was reported in the *Lancet* of March 28, 1925.

There are three lines of attack: (1) By general or non-specific methods; (2) by bacteriotherapy; (3) by chemotherapy.

(1) General treatment includes rest, fresh air, dieting, hydrotherapy (this is more popular in America), elimination by bowels, skin and kidneys, anodynes, stimulants (especially port), treatment of the site of infection, &c. Sir Thomas Horder was opposed to the use of strong antiseptics intravenous infusion and the infusion of whole blood. Mr. Rowlands advocated the excision of infected wounds, and the removal of sources of infection as a prophylactic measure. Arsenic was placed first among the various drugs used, 1 gr. of sodium cacodylate in 2 c.c. of a saturated solution of nucleic acid or sodium nucleinate being given intramuscularly twice daily throughout the disease. The smell of the breath indicates when the patient is saturated. After arsenic comes opium, then quinine, strychnine, digitalis and the hypnotics.

(2) Bacteriotherapy.—Under this head come the intravenous injection of anti-streptococcus serum (an anti-serum for the staphylococcus cannot be prepared), the use of autogenous sensitized vaccines and immuno-transfusion. The results obtained have not been encouraging.

(3) Chemotherapy.—Chlorine, coal-tar derivatives and colloidal metals have all failed to give satisfactory results, and though Dr. Colebrook spoke of the neo-salvarsan group as being nearly specific for the *Streptococcus hæmolyticus*, the general opinion was that little advance had been made in the treatment of generalized blood infections, especially in the chronic cases.

[illegible]fessor Dudgeon gives the result of [illegible] 330 cases of [illegible] infections with perchloride of mercury or [illegible] 220.

Including twenty five cases which [illegible] before treatment was begun, forty seven deaths occurred; six of these [illegible] malignant endocarditis, [illegible] disease entirely failed to respond to [illegible] with either or both [illegible]parations.

It should be noted that treatment is to be instituted at the earliest possible [illegible], without waiting till the infection is proved to be generalized by means [illegible] blood culture. This is especially the case in obstetrical infections, and [illegible] by *Staphylococcus aureus*.

[illegible] of mercury.—Technique: 5 c.c. of a 1 in 1250 solution of perchloride of mercury ($\frac{1}{75}$ gr.) in saline is given as a first dose and repeated in [illegible] or twenty four hours according to the patient's condition. If four injections over a period of three days fail to produce definite improvement, it is useless [illegible] the treatment. The solution is always freshly prepared and injected [illegible] vein which is rendered prominent. A little blood is allowed to run [illegible] and mix with the solution before it is injected.

[illegible]—Thrombosis.—This complication has occurred from time to [illegible] previous reviewers of this treatment to be abandoned. By [illegible] mix with the solution before injection it can be avoided. [illegible] to the wall of the vein, or into the surrounding tissue, may lead to [illegible] serious consequence. Local thrombosis took place in only [illegible] Dudgeon's cases.

[illegible] be severe and come on within an hour or two of the injection [illegible] but if it causes much exhaustion must be treated by saline [illegible].

[illegible] develop within twenty four hours of the injection and is some[illegible] to treatment.

[illegible]—This is the most serious complication and the urine should always [illegible] examined before and during treatment. In the series of cases reported it did [illegible] appear at all.

Two cases of septicaemia with albuminuria were successfully treated, but in [illegible] case the renal efficiency was regarded as satisfactory. Reactions may be [illegible] local or general. A slight rise of temperature may follow the injection and [illegible] may be shivering, or a true rigor followed by a rise in temperature. The temperature may be normal in twenty four or forty eight hours, or further injec[illegible] may be necessary.

[illegible] though the progress of the disease may be checked, full recovery [illegible] delayed for a long period. The longer the acute stage has lasted before [illegible] injections are begun, the more the chances of improvement are diminished.

With improvement in the constitutional symptoms recession of the local lesion [illegible]. In cases with closed abscess formation the treatment is useless. To [illegible] after the injection, keep the patient warm and give 10 gr. of aspirin [illegible].

[illegible]chrome 220 was used intravenously in addition to, or instead of, [illegible] of mercury in 100 cases. Mercurochrome in saline haemolyses red [illegible] *in vitro*, but was used for intravenous injection in strengths of 1 in [illegible] 1 in 750 in saline without complications. Injections have been [illegible] five days without ill effects, but the results were not so dramatic as [illegible] perchloride.

Dos[illegible]—Severe reactions complicated with stomatitis have followed excessive dosage. 10 c.c. of a 1 in 200 solution of the preparation in saline is the maximum which should be given. With repeated inoculations reduce the strength to 1 in 500 after the first two or three cases of nephritis, with blood albumen and casts, have followed injections of 1 in 100 strength. In 20 per cent of the cases treated with mercurochrome no benefit resulted.

Medical Notes.

TREATMENT OF INSOMNIA IN LOBAR PNEUMONIA.

By Surgeon Captain R. W. G. STEWART, O.B.E., M.B., F.R.C.S.

Persistent restlessness and insomnia are of ill omen in pneumonia, owing to the general exhaustion produced, and are of grave significance when delirium is absent. These symptoms are the combined result of cough, pain, dyspnœa, toxæmia and general discomfort. Having regard to the differences of opinion as to the desirability of giving opiates in pneumonia, the views of various authorities on the treatment of this condition are summed up in the following notes:—

In the early stages—say before the fifth day—morphine is much the most effective agent for the purpose, and I think it wise to use it unhesitatingly at this period in order that the patient may have some sleep in hand. After the fifth day it is rarely safe to use morphine, and some other hypnotic must be chosen. Opinions differ as to which is the most suitable. Chloral, which is one of the most effective, is often said to be dangerous because of its depressing effect upon the circulation, but I would suggest that the danger is exaggerated. Paraldehyde is the safest, but is apt to be uncertain in its action. I believe that it is commonly given in too small doses, and that 3 dr. at least are required to ensure an effect. If the taste is objected to it may be given in larger doses by the rectum. I have been disappointed with the action of the veronal group in pneumonia. For the allaying of cough which is causing insomnia, codeine is probably the best remedy. —Dr. Robert Hutchison.

One symptom which must not be allowed to persist is insomnia. It threatens all severe cases from the outset, and the treatment for it is morphia hypodermically. The patients who are allowed to lie awake during the first three nights of pneumonia are in imminent danger of death from exhaustion in the last three.

If the patient is not seen till the disease is well advanced and the heart already weak, paraldehyde in 1 or 1½ dr. doses is a useful hypnotic and not depressant. Hypnotics like trional and veronal are mere waste of time.—Boxwell and Parser.

I have no doubt as to the great value and comparative safety of injecting morphia in the early stage of the disease in healthy subjects. In elderly people it is important to exclude albuminuria. When there is acute pain a full hypodermic dose of $\frac{1}{4}$–$\frac{1}{2}$ gr. morphine is often wonderfully beneficial when given at the onset, as it not only relieves the pain and restlessness but helps to counteract the shock of the rigor and tends to induce sleep. One large effective dose is better than several smaller ones. Later on the pain is not as a rule distressing except when the patient coughs, and for this Dover powder in 5–10 gr. doses for adults is generally efficacious, and may even be given on occasion to children who do not tolerate other opiates at all well. Opium or its pills should be used with caution and not given continuously as they check expectoration and are entirely contra-indicated when there is evidence of a dilated right heart with cyanosis. In strong young subjects with healthy kidneys and no cyanosis a hypodermic injection of $\frac{1}{6}$–$\frac{1}{4}$ gr. of morphine (or $\frac{1}{12}$–$\frac{1}{8}$ gr. of heroin) is often more efficacious than any drug given by the mouth. The morphine may be combined with $\frac{1}{120}$ gr. of strychnine or atropine to correct its depressant action. Syrup of codeine will often relieve the cough. Dover powder is perhaps the best and safest preparation of opium. Hypnotics such as sulphonal, trional, medinal, tetronal and particularly veronal are not only unreliable but may be extremely [illegible] doses is a safe and useful [illegible] regarded as the safest and [illegible] will be [illegible] rather uncertain [illegible] and may be given [illegible] potassium [illegible] to be given in large [illegible] more than [illegible] or without bromide [illegible] in the early stages [illegible] in the late stages [illegible] 20 gr. of chloral and 30 gr. of bromide [illegible] six hours, refreshing sleep in a patient [illegible] and insomnia. Young children who [illegible] small doses of syrup of chloral. [illegible] method is to give 1 oz. of brandy or whisky [illegible] the patient usually goes to sleep and [illegible] necessary. Alcohol [illegible] Three [illegible] oz. alcohol with 10-15 gr. of Dover's powder [illegible] Brandt [illegible]

[illegible] frequent and distressing symptom and requires [illegible] 10 gr. of Dover powder or an injection of morphine [illegible] effective. In the later stages morphine should only be given [illegible] in association with atropine [illegible] gr. and [illegible] 2 dr. with syrup of orange in 3 oz. water is safe [illegible] Chloralamide 20-30 gr. with bromides may be tried.—R. A. Young [illegible]

[illegible] opium (or morphia) is sometimes startling in its beneficial effects, [illegible] sleep and freedom from anxiety. We certainly think that it [illegible] with circumspection and that it is absolutely a dangerous remedy [illegible] general congestion and severe delirium due thereto or in one [illegible] or Bright's disease. We may summarize the question as to its [illegible] saying that the indications for opium as a rule outweigh those [illegible] Taylor.

[illegible] will often bring sleep. If this fails, hypodermic injection of morphia [illegible] repeated in an hour if necessary is the best remedy provided there [illegible] complications or copious bronchitis. Other remedies such as sulphonal [illegible] and paraldehyde are usually disappointing. A full dose of brandy [illegible] produce sleep. In many cases a sound sleep will save life. Often [illegible] by the judicious use of morphine.—Latham.

One ounce [illegible] with some milk food will tend to promote sleep when the room [illegible] dark and well ventilated. If drugs are required, the choice will lie [illegible] of morphia, opium, bromide and ammonia or full doses [illegible] is one of the best hypnotics I am acquainted with. It has [illegible] pungent disagreeable taste. I have found it a very useful [illegible] mixed with spirits of wine and 1 dr. of tincture of orange. A hypodermic [illegible] of $\frac{1}{4}$ gr. of morphia will in many cases give more satisfactory results than any drug by mouth. In cases where drugs are indicated to [illegible] preparation of codeine will often prove valuable. It may be [illegible] the syrup or $\frac{1}{2}$ gr. of the phosphate with a few grains of citric acid and [illegible] is a good remedy and will be found more useful than preparations of [illegible] If codeine fails to ease the cough there is no better remedy than [illegible] powder given in doses of from 10-15 gr. In many cases it acts like a [illegible] relieving the troublesome irritation and giving the patient some refreshing [illegible] food.

[illegible] is often most intractable. Paraldehyde occasionally acts well and [illegible] but far oftener it fails entirely. Trional and sulphonal may [illegible] Morphia is often our only [illegible] but [illegible] would appear to be a risky remedy—Lindsay.

[illegible] sleeplessness and delirium [illegible] the most difficult [illegible] pneumonia. Prevention is better than cure [illegible] the [illegible] all unnecessary moving and disturbance. During the first [illegible] days [illegible] no distress of breathing, no cyanosis and the [illegible] are healthy [illegible] make sure that the patient shall sleep. This can generally be secured [illegible] Dover powder. Afterwards it is a much more [illegible] matter. We [illegible] the reckless use of sedatives, but it is wrong to say that [illegible] given. When their use has been decided upon, paraldehyde is perhaps the best because the safest; to avoid its objectionable [illegible] it can be given per rectum in 1–3 dr. doses. Chloral and bromide and chloralamide are [illegible] frequently used, whilst others prefer opium or morphia—Hilby.

Apart from drug treatment skilled nursing is of the utmost importance. It is almost better for a pneumonia patient to be looked after by an average [illegible] first class nurses, than by a chest expert and insufficient nurses (Murray Lyle). Fresh air, judicious feeding, complete repose of body and mind and tepid sponging of the whole body in the evening will tend to promote comfort and induce sleep. Do not interfere unnecessarily, but keep the patient under close observation and watch for any disquieting symptoms.

Notes on Tropical Medicine.

By Surgeon Rear Admiral Sir P. W. BASSETT-SMITH,
K.C.B., C.M.G., F.R.C.P., F.R.C.S., R.N. (ret'd).

Malaria.—N. B. Graham (*Journ. Med. Sci.*, July 192[illegible]) notes that [illegible] fifty six cases of general paralysis five deaths occurred due to [illegible] the injections of tertian malaria used therapeutically. [illegible] of the [illegible] treated were discharged as cured. Schulze (*Deutsche Med. Woch.*, November 19[illegible]) used a strain through eighty passages without the appearance [illegible] infection was easily cured with quinine given for three days and there were no relapses. Trommer and Baltzer (*Klin. Woch.*, 1925, vol. ii, No. [illegible]) describe a case of locomotor ataxia injected with tertian malarial parasites who after [illegible] attacks became very ill, then collapsed and died. At the post mortem a greatly enlarged malarial spleen was found which had ruptured in three places. There was no history of any injury. A. N. Kingsbury (*Ind. Med. Gaz.*, August 1925), from experience of two cases of malaria found that mercurochrome 220 had no curative effect, and that its unpleasant sequelæ contra-indicated its use.

Ticello and Crato (*Journ. Trop. Med. and Hyg.*, March 192[illegible]) from their experiments with rabbits found that insulin in the solid form had not lost its efficiency after thirty-five days at 32° C., whereas in the liquid state it was reduced by half.

Nikolai and Tjeson (*Geneesk. Tijdsch. v. Ned. Ind.*, 1925) show that chenopodium oil may vary very much in its anthelmintic powers without any apparent alteration in its physical characters. A sample used in the hospital on [illegible] cases gave a percentage of [illegible] cured instead of 80. The loss of power was not due to adulteration of the drug.

[illegible]

[illegible] [illegible] [illegible] ... of the [illegible] loss of [illegible]

[illegible] that the nasal [illegible] by the [illegible]

[illegible] states that [illegible] it replaces [illegible] failed to do.

[illegible]

[illegible] the [illegible] Med. Corps, October [illegible] state that [illegible] group together with anaerobically grown Shiga [illegible] to men without causing any greater reaction than with [illegible] Shiga under ordinary circumstances is so toxic as to be impossible [illegible].

[illegible] October, 1925, found considerable and rapid improvement [illegible] of a Shiga Strong Flexner vaccine given by the mouth.

Notes on Pathology.

By [illegible] F. PRISTON, M.B., M.R.C.P., D.T.M. & H., I.M.S.

It has been shown that organisms which can infect a particular species of animal will grow [illegible] in the fresh whole blood of that species, whilst the [illegible] will not grow in the blood of a species normally insusceptible. [illegible] will multiply in the blood of the susceptible mouse or rabbit [illegible] not grow in the blood of the insusceptible chicken, cat or dog. [illegible] shown that in the same way the colon bacillus is not [illegible] and will [illegible] survive in their blood in vitro whilst [illegible] found grew in 13 out of 15 normal bloods.

[illegible] strain isolated from the spinal fluid of a case [illegible] normal human bloods, whereas strains isolated from the [illegible] would not grow in most of the same bloods [illegible] of the men [illegible] a carrier were able to grow in vitro [illegible] cerebrospinal fever.

On these facts [illegible] Colon bases a general theory that organisms living in the naso-pharynx and upper respiratory tract are unable to infect a man in whose blood they cannot grow [illegible] the organisms are able to grow in that [illegible] blood they may invade the blood stream and cause metastatic [illegible] infection without necessarily causing any perceptible lesion at the point [illegible].

When swabs are taken from the naso-pharynx and cultured on the usual media, [illegible] of different organisms may grow, and those predominating in the [illegible] from which vaccines are commonly made, may not be the organisms [illegible] treatment [illegible] that [illegible] respiratory [illegible] trouble [illegible] culturing [illegible] can [illegible] isolated other bacteria [illegible] saprophytic [illegible] the bottom [illegible] adds [illegible] Barrel [illegible] surface [illegible] pathogenic [illegible] plating [illegible] twenty-four [illegible] Vaccines may be [illegible] and a number [illegible] endocarditis [illegible] are related [illegible] improvement was obtained in [illegible] The author [illegible] treatment of [illegible] from giving rise to [illegible] Thus the organism [illegible] responsible may persist [illegible] the patient. This stage [illegible] resistance of the patient to that particular [illegible] the author's method.

Rage [illegible] and Philipp (*M*[illegible] Hooker [illegible] a [illegible] which they believe to have a prognostic [illegible] streptococcal septicaemia. Rage takes [illegible] a case of streptococcal infection and inoculates [illegible] obtaining the patient's own streptococci. A drop of [illegible] slide and examined microscopically at intervals [illegible] do not multiply for four hours or more, the patient's [illegible] prognosis favourable. If the organisms multiply [illegible] likely to do so in the patient's body also and the prognosis [illegible] a larger quantity of blood from the patient during a rigor [illegible] plates at once and at intervals up to twelve hours [illegible] on the plates after incubation. This method [illegible] takes use of [illegible] actually circulating in the blood of the patient.

Joseph and Sachs (2) [illegible] by these methods 42 cases, mostly febrile, short [illegible] but some [illegible] cases were included. Both tests were carried out on [illegible] cases the tests agreed and in 30 of these the result of the case [illegible] with the prognosis given by the tests. In three more of the [illegible] failed to multiply in both tests at first but later the patient's [illegible] streptococci then grew in further tests and the patient died. In [illegible] disagreed and Philipp's test proved right in three of those which [illegible] was right in the fourth. Joseph and Sachs consider the tests useful [illegible] they prefer Philipp's. Radice (3) has used the same tests on [illegible] similar to those of Joseph and Sachs. In his paper reference [illegible] to the literature.

Where cases of [illegible] are thought to be caused by local infections in [illegible] confirmatory evidence may be obtained by ascertaining [illegible] suspected organism will grow in the patient's own blood. At the present time great difficulty is experienced in making a vaccine to treat such cases [illegible] no means of finding out what organism is responsible. The method [illegible] vaccine suggested by Solis Cohen may be an easy way of identifying and isolating such an organism.

REFERENCES

(1) [illegible] *Lancet*, 1924 [illegible] 591
(2) [illegible] 1924 [illegible] 1412
(3) [illegible] 1925 xlix 1270

Preparations, &c.

HYPEROL

([illegible] F. W. Berk and Co., Ltd., 106, Fenchurch Street, [illegible])

[illegible] is the name given to solid hydrogen peroxide [illegible] and hydrogen peroxide, its formula being [illegible] contain 35 per cent. H_2O_2. It is supplied [illegible] The tablets form a very convenient method of [illegible] are sold in bottles of fifty tablets at 2s. 0d. per bottle.

Reviews.

[illegible] DIAGNOSIS OF THE ACUTE ABDOMEN. By Zachary Cope, [illegible] F.R.C.S., Senior Surgeon to Out-patients, St. Mary's Hospital [illegible] London: Humphrey Milford, Oxford University Press. [illegible] pp. [illegible] 28 diagrams. Price 10s. 6d. net.

[illegible] to the first edition Mr. Cope states: "There are still many who [illegible] to the full the significance of the earlier and less diagnostic [illegible] acute abdominal disease, who regard the increased frequency of the [illegible] of the overlying abdominal muscles as necessary [illegible] the early stages of appendicitis, or find it hard to believe that a patient with [illegible] abdomen and normal pulse and temperature can be [illegible] perforated gastric ulcer."

[illegible] will confirm the truth of these remarks and [illegible] frequently point to tragic instances of this want of knowledge. [illegible] to the expert clinician the diagnosis of the acute abdomen has been [illegible] sound footing for more than twenty years and the necessity for surgical interference can be gauged with the utmost certainty, this same knowledge is but slowly infiltrating the practice of the general practitioner.

How often is the surgeon who finally takes charge of a hopeless case confronted with the excuse—"But I did not think operative interference was sufficiently indicated." [illegible] A study of this little manual, say a couple of evenings' interesting reading, and the intelligent application of the diagnostic methods laid down will save the general practitioner much loss of prestige and go far to abolish the appalling statistics given of deaths from appendicitis, obstruction and hernia. It should be noted that, from the surgical standpoint, with few exceptions these are preventable deaths, and yet their total amounts to 6,598 in one year. Surely if ever a book was necessary, a book like this, which clearly indicates the means of avoiding these disasters, must be. In simple, easily understood language the symptoms of the more common abdominal emergencies are carefully described, the anatomical foundations of the diagnosis insisted upon, and the lesser known applications of one's anatomical knowledge tabulated. The operations are wisely not given. The whole object of the book is to aid in deciding whether surgical intervention is necessary, and to make sure that such intervention takes place whilst the patient has still a chance of recovery.

The importance of the factor of time is insisted upon. In a case of perforated gastric ulcer recovery is usual if operated upon within six hours, probably if within twelve hours, and almost impossible if twenty-four hours have elapsed. I have operated upon one patient within an hour of his perforation and it was difficult to believe, eight hours afterwards, that he had any ailment at all.

Early diagnosis and early operation are what the operating surgeon prays for, and unfortunately for the patients, both are uncommon.

In connection with perforated gastric ulcer [illegible] examination in order to gauge pelvic tenderness a little [illegible] upon

The patient is often first seen by the operat[illegible] by Rutherford Morison as the dangerous period [illegible] intervenes between the primary shock and the stage [illegible] is safe to say that more fatal mistakes in diagnosis [illegible] of knowledge or appreciation of this period than all other [illegible] Be it remembered that the object of the examination [illegible] to decide the diagnosis, useful though that may be [illegible] interference by opening the abdomen is justifiable [illegible] venience of this dangerous period that an incomplete [illegible] or too hasty examination may mislead the surgeon into [illegible] that [illegible]

In my experience this dangerous period may last [illegible] twenty [illegible] hours, after which there will be a recrudescence of [illegible] and the patient will be found to have travelled far on the downward path [illegible] In the *British Medical Journal* of December 11 1920 Mr Burgess [illegible] classified the acute abdomen into Colics, Perforations [illegible] tions and Obstructions and in my opinion it is to be regretted that Mr [illegible] not seen fit to follow Mr Burgess's lead The classification [illegible] mind and has always proved of the utmost help to the examination [illegible] case But this is the only criticism that can be [illegible] against a volume which in its small compass conveys such a mass of valuable information

J R M

Cancer Volume II Post Graduate Lectures delivered under the auspices of the Fellowship of Medicine. Edited by Herbert J Paterson with a preface by Sir John Bland Sutton, LL D F R C S President of the Royal College of Surgeons, London London John Bale Sons and Danielsson Ltd Price 12s 6d net

Although the true pathology of cancer has not yet been determined certain features of its origin its spread and its consequences are recognized as being beyond dispute These basic facts vary enormously in every region of the system which is open to attack In this book will be found such information which is placed before the reader as lucidly as possible by those who are entitled, by their practical experience to write with authority

Sir John Bland Sutton in his preface ably summarizes the scope of these lectures and the reviewer offers no apology in following his excellent example for the purposes of classification

Sir Thomas Horder does not accept the high percentages frequently quoted in which carcinoma supervenes on gastric ulcer the majority of both pathologists and surgeons in this country will support him On the other hand he points out that many cancer patients live longer and less painfully [illegible] the employment of radio active therapeutics Such a generalized statement [illegible] very doubtful value unless backed by clinical evidence

Dr Archibald Leitch discusses the general pathology of cancer He lays stress on the pre cancerous conditions as a preventive operation he would remove all patches of leucoplakia for instance He would indeed [illegible] surgeon but [illegible] experience may justly be opinion Nevertheless at the [illegible] we are faced with the fact that the recognition of pre cancerous conditions is in many cases impossible

In cancer of the larynx Sir StClair Thomson draws attention to the fact that this form is responsible for only 1 8 per cent of the total cancer mortality [illegible] For intrinsic disease the operation of laryngo fissure has given a percentage of cures as high as 80 per cent The subglottic and extrinsic varieties do not carry such a favourable prognosis Diagnosis of laryngeal cancer is well explained and beautifully illustrated He concludes with some observations on the operation of laryngectomy which will find general acceptance among British surgeons

Mr H S S[illegible] enhances the striking incidence of [illegible] and carcinoma of the [illegible] at a comparatively early age [illegible] nately can give no reason [illegible] peculiar fact After discussing the pathology and symptoms he acknowledges the importance of x rays in the [illegible]. In treatment [illegible] of views regarding the [illegible] ... [illegible] dilatation are described concisely [illegible] that the operation [illegible] but that a surgeon can give [illegible] [illegible] the [illegible] problem

Mr Sampson Handley's lecture on the early clinical signs in the diagnosis [illegible] of the breast is founded on his own ripe experience and could not [illegible]

Mr Herbert [illegible] discusses cancer of the stomach fully This is the [illegible] book Articles on cancer of the uterus intestines [illegible] complete the series. In a brief review it is manifestly [illegible]

It [illegible] that this book should be read by every medical man [illegible] not only read but also digested, two results would follow viz the mortality rates for cancer would diminish and the percentage of patients cured would increase H E R S

SEX HYGIENE A Handbook upon matters which are vitally connected with the enjoyment of good health Intended for the use of parents to aid them in enlightening and safeguarding their children when puberty is reached By Oliver Wahlo Lincoln London John Bale Sons and Danielsson Ltd 19[illegible] Pp 33 Price 1s

It is fortunately becoming recognized that children upon reaching an appropriate age should have imparted to them by their parents or other suitable persons clean and wholesome information concerning sex matters Such a procedure is obviously infinitely preferable to the older method of allowing them to pick up pernicious misinformation upon these matters from ignorant and possibly evil minded people Educationists now realize that proper sex instruction is of paramount importance in the moral and physical training of the young, and Mr Lincoln's handbook is a valuable addition to the too scanty existing literature which is really suitable for this purpose He deals with the subject in a simple and straightforward manner, and parents faced with the none too easy task of approaching their children upon these matters will find this book a great assistance

Although agreeing with the bulk of the opinions expressed by Mr Lincoln we consider that the evils he describes as resulting from masturbation are overstated and over stressed and that if any child addicted to this habit even if only practised occasionally was threatened with the dire penalties detailed by the author a condition of profound depression and fear would be produced without [illegible] with bringing about a cure and were the child one with an unstable mental equilibrium—a type peculiarly addicted to this habit—a highly detrimental mental conflict would almost certainly result, with disastrous consequences [illegible] is that the best deterrent to masturbation is after having appealed to [illegible] better nature, to tell him that self abuse is bound to decrease his physical courage his efficiency at games and school work and if persisted in will [illegible] his future success in life and happiness at the same time emphasizing the importance of working and playing hard Habitual masturbation is much [illegible] a symptom of a weak nervous make up than a cause, consequently [illegible] the individual is about the worst form of treatment

As venereal diseases are dealt with in this book it is inferred from its [illegible] the author's idea that instruction concerning these diseases should [illegible] to children at the age of puberty Personally we consider that such a [illegible] but undesirable [illegible] on one [illegible] until such [illegible] out [illegible]. This view is supported [illegible] to instruct [illegible] drafted [illegible] H.M.S. [illegible] years [illegible] from 18[illegible] and [illegible] buried and [illegible] destroyed. The records of [illegible] appears to be [illegible] three [illegible] stories, which [illegible] to the [illegible] highly recommend Mr. [illegible]

G. I. P.

[illegible] M.R[illegible] M.B. [illegible] F.S. Lond. M.R.C.S., L.R.C.P. [illegible] St. Mary's Hospital, London. [illegible] Milford [illegible] Pp. 16[illegible] Price 7s. 6[illegible]

This small [illegible] concise form the chief anatomical changes found [illegible] disease, and forms a [illegible] of [illegible] reference to students [illegible] and pathologists.

The authoress [illegible] important changes which may be expected in the different pathological [illegible] making this book of distinct value to those who either from lack of [illegible] experience or extensive reference to the larger textbooks wish to [illegible] of the more characteristic pathological appearances—both local and general—which may be expected or found in any given case.

The external and internal appearances in cases of death from asphyxia, syncope and coma are first detailed followed by the signs of death. This follows a short and concise account of the method of performing a post-mortem examination and the way of preserving specimens for further examination and of taking material for bacteriological tests and culture.

Section 1 deals with the physical causes of death other than disease—such as drowning and electricity, and also the distinctive appearances and effects in the various kinds of poisoning.

Section 2 deals with general metabolic diseases, such as gout and diabetes.

Section 3 includes the general infections from pyaemia to tuberculosis, syphilis and the acute infections. The chapter on tuberculosis and syphilis is fully descriptive of the various systems and organs affected.

Section 4 describes the appearances in diseases of the digestive system and whilst giving for instance a case of gastric carcinoma, also details the secondary and accompanying conditions to be noted in the cardio-vascular and respiratory systems. The same arrangement is followed throughout, thus making it easy to associate the various pathological changes occurring as part of the general infection such as in typhoid.

Section 5 diseases of the kidneys giving the local and general conditions in the different forms of nephritis and [illegible]

Section 6 diseases of the respiratory system, pleural effusion and empyema. It is stated that the sero-fibrinous exudate in pleurisy is practically always tuberculous in origin.

Section 7, diseases of the ductless glands. The findings in Addison's disease, myxoedema, &c. are fully and well expressed.

Section 8 diseases of blood and blood forming organs. The anaemias and Hodgkin's disease with their characteristic changes in the haematopoietic and other organs.

[illegible] diseases of the cardio-vascular system [illegible] syphilitic aortitis and [illegible]
[illegible] with the diseases of the [illegible] system, and only [illegible] macroscopic changes [illegible] is therefore [illegible] tabes and dementia paralytica are well described
[illegible] with an appendix giving the anatomical normal [illegible] table showing the dates of ossification of the [illegible] and after birth

[illegible] undoubtedly supplies a want and gives [illegible] arranged manner. It is convenient for quick reference [illegible] likely pathological changes to be looked for in the [illegible] conditions, the detailed descriptions of which are clearly [illegible]. The [illegible] has evidently had considerable experience in [illegible] work, which has enabled the important changes to be selected and [illegible].

[illegible] can confidently be recommended to all those who may at any time [illegible] to perform a *post mortem* examination, and will be especially [illegible] on the larger textbooks on pathology and *post mortem* work [illegible] available. Being one of the Oxford Medical Publications the [illegible] well [illegible] and produced and contains a carefully arranged index.

L. M. M.

[illegible] Dyspepsia. By Robert Hutchison, M.D., F.R.C.P. London: [illegible] Arnold and Co. 192[illegible]. Cr. 8vo. Pp. 176. Price 6s. net.

[illegible] is intended solely to help the practitioner in a common but [illegible] medicine. The author considers that the practitioner's [illegible] the organic from the functional cases. Lectures I and II [illegible] the clinical investigation of dyspepsia and the diagnostic value of [illegible] wasting. The various extra- and intra-abdominal causes of [illegible] and it is pointed out that *real* abdominal pain almost always [illegible] cause. Four lectures are devoted to the Organic and Functional [illegible]. Stress is laid on the fact that three symptoms which either singly [illegible] nation point to organic disease are real pain, frequent vomiting and [illegible] wasting. If any of these symptoms are conspicuous mere functional [illegible] almost certainly be excluded. Test meals are stated to be of very [illegible] the diagnosis of gastric ulcer, but an *x* ray examination may be of [illegible] help. In the case of duodenal ulcers a test meal is often of [illegible] confirming the diagnosis, but *x* rays on the whole give less help [illegible] ulcer.

[illegible] to some to hear that chronic gastritis is a rare condition, but the [illegible] of the truth of this statement. Further it is one of the few [illegible] the use of the stomach tube is almost imperative in order to [illegible] diagnosis. In Lecture VII it is stated that the main causes of [illegible] are nervous, *e.g.*, mental and emotional overstrain and [illegible] final chapters chronic diarrhœa and constipation, muco[illegible] and what may be termed the "chronic abdomen" are [illegible].

[illegible] read with profit by all naval medical officers and will be [illegible] for the diagnosis and treatment of cases of dyspepsia.

R. W. G. S.

[illegible] Therapy, including Vaccine Therapy, Serum Therapy, Gland [illegible] Diagnostic Proteins. Parke, Davis and Co., 50, Beak Street, [illegible], W.1. 192[illegible].

[illegible] the above title Parke, Davis and Co. have issued for the convenience [illegible] medical profession this little volume [illegible] combining those publications [illegible] of remedies mainly obtained from bacterial and animal sources [illegible] issued separately [illegible] excellent summary of our [illegible] introduction, written [illegible] on the prophylactic [illegible] and keeping properties [illegible] ous and stock vaccines [illegible] Hospital [illegible] which will be found of great [illegible] In this connection [illegible] the [illegible] and extensor [illegible] but serves as a guide to dose [illegible] will be found of great [illegible] information on these subjects is [illegible] but is practical and well up to [illegible] particularly instructive and contains details [illegible] therapeutic application [illegible] with [illegible] protein skin tests and the use [illegible] volume

[illegible] as this volume is circulated exclusively amongst [illegible]

[illegible] useful to naval medical officers R W G S

[illegible] AND [illegible]ALLERS AND OTHER ATHLETES By F G Harwood [illegible] London John Bale Sons and Danielsson Ltd [illegible]

[illegible] of 12 pages, intended to outline in as few words as [illegible] first aid treatment of injuries to football players &c [illegible] generally sound but in many cases is too brief to be of real [illegible]

[illegible] AND ANSWERS IN FIRST AID By F G Harwood London John Bale Sons and Danielsson, Ltd Second Edition 1925 Price 6d net

A little book of 21 pages based on the St John Ambulance Association text book with the addition of a few hints on competition work It can be recommended to medical officers conducting an examination in first aid

THE TREATMENT OF FRACTURES AND DISLOCATIONS IN GENERAL PRACTICE By C Max Page, D S O M S Lond F R C S Senior Surgeon to Out-patients St Thomas's Hospital Surgeon to the Ministry of Pensions Hospital Roehampton and W Rowley Bristow M B B S Lond, F R C S Surgeon to the Orthopaedic Department, St Thomas's Hospital Surgeon to St Nicholas Country Hospital for Children Pyrford late Surgeon to the Ministry of Pensions Orthopaedic Hospital Shepherd's Bush Second edition Pp xiii + 379 with 143 illustrations London Humphrey Milford Oxford University Press Price 12s 6d net

The second edition of this book which was written to supply the general practitioner the house surgeon and the medical student with a practical hand book bears witness to the advance that has taken place in the treatment of fractures The setting of these is no longer "largely a myth" rather is it truer to say that "the reduction of a fracture is as important as the reduction of a dislocation

X rays wai experience, the insistence on accurate anatomical [illegible] fragments which culminated in open operation and plating have [illegible] so raising the standard of treatment, and it is fortunate that methods [illegible] which as the authors point out require neither vast experience nor [illegible] apparatus

It is these methods which are set forth in this book, and the basis of [illegible] the successful application of extension combined with the use of plaster [illegible] skeleton and gutter splints

Details of open operations, which may be required in special cases [illegible] given

The familiar padded wooden splints are not recommended, but Hodgen's [illegible] for fractures of the femur still finds a place Sinclair's foot piece, which [illegible] hands has not been found satisfactory is used to obtain extension in [illegible] of the tibia and fibula, and plates showing its parts and application are given Some explanation of the figures shown in plate 120a would be helpful

Early movement is of course usually advisable but the following exceptions are given In simple fractures involving joints, immobilization for three weeks after reduction of the fragments, is advocated in preference to early massage and movement Immobilization for three weeks is also recommended for dislocations of the elbow joint as myositis ossificans is especially liable to follow this injury The excellent plates illustrate the absorption of new bone in a case of traumatic myositis ossificans as the result of prolonged rest with the arm flexed

For compound or "open" fractures, as the authors prefer to call them early [illegible] of the wound tract is advised, if they are due to direct violence eusol or bismuth iodoform paste being used as a dressing

There are a few errors in the references to the illustrations on p 59 Fig 105b should be Fig 111b on p 180 Fig 17 is given for Fig 16a on p 187 Fig 101 for Fig 98

Much of the teaching in this book has crystallized out of the discussions of a committee at St Thomas's Hospital of which the authors were members whose findings were reviewed by Sir Robert Jones It represents the fruit of mature judgment and practical experience and the reader can turn to it with full confidence for information and guidance L W

Alcohol in Medical Practice with a Chapter on the Evolution of Medical Opinion By Courtenay C Weeks M R C S, L R C P London H K Lewis and Co, Ltd 1925 Price 3s 6d net

In this recent publication the author, who holds the opinion that alcohol is of very little use in disease, makes a strong appeal for a more restricted use of it in medical practice

The routine and early use of alcohol is deprecated and the danger is emphasized of using and speaking of it as a "stimulant," whilst it is so generally recognized in scientific circles as a depressant Facts and figures collected from [illegible] sources are presented which indicate the present day views of the medical profession concerning the therapeutic use of alcohol It is urged that if [illegible] at all it should only be as a temporary measure for tiding a patient over [illegible] emergency and not for continued medication In such cases it is mainly [illegible] as a rapidly diffusible narcotic with a certain amount of food value

It would appear that an increasing number of practitioners have practically [illegible] alcohol from treatment There are many however who still use it [illegible] regard it as stimulant although its action as such is now disputed

The Medical Investigation Committee of the Medical Research Council in [illegible] chapter on alcohol in medicine say "The popular belief in alcohol as a [illegible] largely based on the illusion that it has an important stimulant action [illegible] the heart on the respiration, and on the vital activities in general

In [illegible] claims [illegible] weight of strictly scientific [illegible] in beverage form by [illegible] no pneu[illegible] disease (b) that there are [illegible] indications for its [illegible] vast majority of cases it [illegible] other more reliable [illegible] constant action

A rigid [illegible] the indications for the [illegible] necessary in view of the [illegible] therapeutic value rests [illegible]

R W G S

What to do in Cases of Poisoning By William Murrell M D F R C P formerly Senior Physician to the Westminster Hospital Thirteenth Edition revised by [illegible] Murrell M D D Sc F R C P Lecturer in Pharmacology and Therapeutics St Bartholomew's Hospital, Medical College, &c late Examiner in the University of London Pp vi + 276 royal 32mo London H K Lewis and Co Ltd 1923 Price 4s 6d net

This well known textbook has now reached a thirteenth edition

It has stood the test of time and proved its worth It is well printed and good use has been made of heavy block type for emphasizing the more important points It is of suitable size for the pocket

It is a valuable book for use in the "emergency cupboard" for poisoning cases treated in an out patient department It could be recommended for use in a Dockyard surgery or would be equally valuable in a sick bay as a handy book of reference.

This book starts with introductory remarks, full of sound advice in dealing with poisoning cases, with valuable hints as to marshalling the facts with a view to giving evidence at future inquiries in court Next follows a discussion on types of poisons, points which help in diagnosis treatment and preservation of specimens Then a chapter is devoted to the fitting out of the antidote cupboard to fatal doses and to medico legal aspects A very full discussion then follows on acute poisons and on chronic poisoning Lastly there is a full and satisfactory index

It is written from the point of view of civil practice and therefore does not deal with chemical warfare, T N T or "aeroplane dope" but includes carbonic and gas poisoning

C H M G

Clinical Researches in Acute Abdominal Disease By V Z Cope, B A, M D M S F R C S London Oxford University Press Price 12s 6d net

Throughout this work the author has displayed keen and critical powers of observation, and nowhere are these of more importance than in acute abdominal disease A great deal of research has yet to be done in this realm of surgery, and a publication such as the above must be helpful and stimulating to us all

Chapter IV deals very fully with cutaneous hyperæsthesia in acute abdominal disease, contains several new observations by the author himself and is well worth careful study

Chapter V shows the importance in the diagnosis of acute abdominal disease, of pain referred to the shoulders The author discusses phrenic shoulder pain at length and appears to have made it a special study Perhaps his conclusions here and there may not be altogether convincing, but he has made out a good case for most of them

The book is small well written and readable, and can be recommended to those of us who may at some time be "up against" one of the most difficult problems a naval surgeon has to face, viz the acute abdomen

A J H

Diseases [illegible] System [illegible] Thomson M.D. [illegible] for Nervous Diseases [illegible] Hospital Consulting Physician [illegible] Maida Vale, and [illegible] Physician to the [illegible] Hospital [illegible] the Paralysed and [illegible] revised [illegible] Cassell and [illegible] 1920 [illegible] with [illegible] and 18 black and [illegible] 102 figures [illegible] text [illegible]

In [illegible] edition [illegible] the former text has been rewritten obsolete matter [illegible] certain additions made in con[illegible] of the advance of neurological science The authors have been at [illegible] to keep the size of the book within its former dimensions, and are to be [illegible] on their success

[illegible] work is arranged [illegible] sections the first being of an introductory [illegible] and containing, amongst other chapters an excellent description of the [illegible] the best methods of eliciting these and their value and significance [illegible] Included also in this section is a useful chapter on methods of [illegible] giving a comprehensive outline of the methods most generally [illegible]

[illegible] sections deal in order with diseases of the peripheral nerves, [illegible] cord syphilis of the nervous system epidemic disease of the central [illegible] system diseases of the brain and of general origin heredo familial [illegible] and the neuroses

[illegible] nervous diseases not included under the foregoing headings are grouped [illegible] in the ninth and last section, the chapter on epilepsy being one of [illegible]

[illegible] plates and other illustrations have been well selected and are clearly [illegible] while the letterpress is printed in good type

[illegible] book is one that we can recommend not only to students but also to [illegible] practitioners C K B

News of the Service

OBITUARY

[illegible] that we report the death of Surg[illegible] [illegible]

[illegible] August 98 1919 [illegible] [illegible] Staff Surgeon [illegible] Alexandria [illegible]

[illegible] the [illegible] Egypt [illegible] 1882 [illegible]

[illegible] Medical Department of the Admiralty [illegible]

[illegible]

—

[illegible]

[illegible] Royal Navy [illegible]

[illegible]

—

[illegible]

—

We [illegible] Surgeon Captain Alfred [illegible] [illegible] (Retd.) [illegible]

Born in 1852 [illegible] 1884 and entered the Service [illegible] Surgeon in 1886. [illegible] Fleet Surgeon in 1909. In 18[illegible] was appointed to [illegible] 1892 as Dental Medical Officer [illegible] medical officers. He retired [illegible] in 1909.

On the outbreak of war in 1914 [illegible] was employed at the Medical Department of the Admiralty. He [illegible] June 1918 being promoted to the rank of Surgeon Captain and awarded [illegible] his services during the war.

HONOURS

[illegible] King has [illegible] pleased to appoint Surgeon Rear Admiral [illegible] M.D., Surgeon [illegible] R.N. Hospital Malta, an Honorary [illegible] the vacancy [illegible] the death of the late Inspector General [illegible] M.D., F.R.C.S., K.H.S., to date [illegible] the appointment [illegible] received the sanction of His Majesty the [illegible]

[illegible] the [illegible] of the Order of the Hospital of St. John of Jerusalem in England [illegible] Captain Montague Henry Knapp, R.N. (retired) [illegible]

[illegible] has been graciously pleased to approve of the award of the [illegible] to Surgeon [illegible] D. F. Macintyre, M.B., R.N.V.R.

EXAMINATION FOR PROMOTION

The following Medical Officers, in alphabetical order, were successful in passing the promotion [illegible] Commander at the end of the [illegible] the course of instruction which commenced [illegible]

Surgeon Lieutenant-Commander [illegible]
A. Craig
R. L. Douglas
[illegible] F. Harvie
[illegible] Macdonald, M.B.
R. [illegible] P. Ferguson, M.B., B.S.
R. [illegible] Rampling
C. N. Ratcliffe

[illegible] Commander W. J. Carr, [illegible] M.R.C.S., L.R.C.P., R.A.N., was also successful in [illegible] examination held at the [illegible]

APPOINTMENTS

DECEMBER

Surgeon Lieutenant-Commander M. J. Aitken, M.B., to H.M. Dockyard, Portsmouth.

JANUARY

[illegible] W. [illegible] Martin, O.B.E., F.R.C.S.(I.), to R.N. Hospital, Plymouth. [illegible] A. B. Clark, M.B., D.P.H., to R.N. Barracks, Devonport. Surgeon [illegible] D.S.O., D.O.M.S., to R.N. Hospital, Haslar (and for specialist [illegible]) [illegible] F. J. Gowans, M.B., to [illegible]. Surgeon Commander C. H. [illegible] Surgeon Commander E. L. Atkinson, D.S.O., A.M., to *Ramillies* (and for [illegible]) Surgeon Commander H. A. [illegible] Knight, to *Malcolm*. Surgeon Commander [illegible] M.B., lent to New Zealand Division; Surgeon Commander G. B. Harvey, M.B. [illegible] Surgeon Commander J. S. [illegible], lent to R.A.N. Surgeon Commander G. H. D. [illegible] *Dauntless*. Surgeon Commander F. L. Wright, to *Caledon*. Surgeon Commander [illegible] H. Ormsby, M.B., M.A., to R.N. Barracks, Portsmouth. Surgeon Commander C. C. [illegible] to R.N. Barracks, Chatham; Surgeon Commander A. T. Rivers, to *Parsons*. Surgeon Commander F. Lewis Smith, to Medical Department, Admiralty.

Surgeon Lieutenant-Commander J. Kirker, to *Ark Royal*. Surgeon Lieutenant-Commander W. F. [illegible], to *[illegible]*.

Surgeon Lieutenant G. Kirker, M.B., to *Colossus*. Surgeon Lieutenant (D) O. J. Farrabla [illegible], *Impregnable*. Surgeon Lieutenant R. M. Brennan, M.B., to *Tamar*. Surgeon Lieutenant W. A. Hopkins, M.B., to *Emerald*. Surgeon Lieutenant J. M. Horan, M.B., to *Wallace*. Surgeon Lieutenant A. F. Phillips, M.B., to *Dolphin*. Surgeon Lieutenant M. B. Devane, to R.N. Barracks, Chatham. Surgeon Lieutenant (D) F. R. P. Williams, to R.M. Infirmary, Deal. Surgeon Lieutenant (D) J. L. Lean, to R.N. Hospital, Haslar.

FEBRUARY

Surgeon Commander W. H. Murray, to R.N. Hospital, Haslar (and for specialist duties). Surgeon Commander A. G. Malcolm, M.B., to R.N. Barracks, Chatham (and for specialist duties). Surgeon Commander D. P. H. Pearson, to *Champion*. Surgeon Commander H. R. B. Hull, to [illegible] (for specialist duties). Surgeon Commander [illegible] M.B. [illegible] R.N. to R.N. Hospital Haslar. S[illegible] [illegible] M.B. [illegible] R.N. Hospital Bermuda (and for specialist [illegible]) [illegible] Cor[illegible]

Surgeon Lieutenant-Commander G. L. Ritchie, M.C., M.B., to [illegible]. Surgeon Lieutenant-Commander W. [illegible]ard, M.D., to R.N. Hospital Malta. Surgeon Lieutenant-Commander [illegible] P. Haynes to H.M. Dockyard, Devonport. Surgeon Lieutenant-Commander [illegible] M[illegible]kenzie to R.N. Sick Quarters, Dartmouth. Surgeon Lieutenant-Commander F. H. [illegible] to *F[illegible]*.

Surgeon Lieutenant G. G. [illegible] to *Ajax*. Surgeon Lieutenant H. W. Strong, M.B., [illegible]. Surgeon Lieutenant T. Mad[illegible], M.B., B.A., to *Bee*. Surgeon Lieutenant D. [illegible], M.B., to *Argyll*. Surgeon Lieutenant W. P. [illegible] Macintyre, M.B., to *Ballymoor*. Surgeon Lieutenant W. McCosh, M.B., to R.M. Infirmary, Chatham. Surgeon Lieutenant J. G. H. [illegible], M.D., to R.M. Infirmary, Deal. Surgeon Lieutenant I. G. Maguire, M.B., to *Royal [illegible]*. Surgeon Lieutenant A. S. Burns, M.B., to *Barham*. Surgeon Lieutenant (D) T. Hu[illegible] *Assistance*.

MARCH

Surgeon Commander J. H. Pendlett to Plymouth Hospital (and for specialist duties). Surgeon Commander S. W. Grimwade, O.B.E., M.B., to *Eagle*. Surgeon Commander J. S. Owens, M.B., to H.M. Dockyard, Portland. Surgeon Commander T. E. Blunt to *Iulosa*.

Surgeon Lieutenant-Commander R. L. Rampling to *Sp[illegible]*. Surgeon Lieutenant-Commander J. C. Semler, M.B., to *Effingham*.

Surgeon Lieutenant A. L. McDonnell, M.B., to *Montrose*. Surgeon Lieutenant D. C. [illegible] to *Mentor*.

RETIREMENTS

Surgeon Commander R. Kennedy, M.B., placed on retired list (on account of age regulation), January [illegible] 1926, with rank of Surgeon Captain.

Surgeon Captain T. T. Jeans, M.B., placed on retired list (on account of age regulation), January 16, 1926, with rank of Surgeon Rear-Admiral.

Surgeon Commander F. A. G. Wilkinson, O.B.E., B.A., placed on retired list (on account of age regulation), January 29, 1926, with rank of Surgeon Captain.

Surgeon Commander C. [illegible] placed on retired list (own request), February 1, 1926.

Surgeon Commander A. K. Smith-Shand, M.B., placed on retired list (on account of age regulation), February 28, 1926, with rank of Surgeon Captain.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

Her Majesty The Queen has graciously consented to become the President of Queen Alexandra's Royal Naval Nursing Service.

Miss Margaret Kennedy Hunt entered as Nursing Sister, January 13, 1926.

APPOINTMENTS

Nursing Sister Miss M. K. Hunt to R.N. Hospital, Haslar, dated January [illegible] 1926 (on probation for six months).
Nursing Sister Miss P. M. Fowler to R.N. Hospital, Plymouth, dated February 2, 1926.
Nursing Sister Miss K. Baker to Dartmouth Sick Quarters, dated February 2, 1926.
Nursing Sister Miss E. A. de Blaquiere to R.N. Hospital, Chatham, dated February 2, 1926.
Nursing Sister Miss D. M. Gunson to R.N. Hospital, Chatham, dated February 2, 1926.
Nursing Sister Miss M. Mitchell to R.N. Hospital, Haslar, dated February 2, 1926.
Nursing Sister Miss D. E. Johnston to R.N. Hospital, Haslar, dated February 2, 1926.

RETIREMENTS AND RESIGNATIONS

Nursing Sister Miss Grace Blakeley resigned her appointment, dated December 31, 1925.
Nursing Sister Miss Lily Fraser invalided, to date February 16, 1926.
Nursing Sister Miss Agnes W. Baird invalided, to date February 24, 1926.
Nursing Sister Miss Vera V. Usher Somers, appointment terminated March 9, 1926.

ROYAL NAVAL MEDICAL CLUB—ANNUAL DINNER

The Annual Dinner of the Royal Naval Medical Club will be held on Thursday, April 2 [illegible] Restaurant (Empire Rooms), Piccadilly Circus, London, W.1. All particulars [illegible] from the Hon. Secretary, Surgeon Commander J. McCutcheon, R.N., [illegible] London, S.W.1.

NAVAL MEDICAL COMPASSIONATE FUND

At the Quarterly Meeting of the Directors of the Fund held on January 13 [illegible] sum of £105 [illegible] to the applicants. The following is an account of the cases relieved:—

[illegible] aged 67 [illegible] Surgeon in Royal Navy [illegible] income consists of a Widow [illegible] Voted £45.

[illegible] Fleet Surgeon in Royal Navy applies on behalf of three [illegible] They are in receipt of Government Compassionate Allowance [illegible] the income from a Trust Fund amounting to £40 [illegible]

Daughter, aged 63, of a Surgeon in Royal Navy. Is unable on account of paralysis [illegible] to work. Is in receipt of a grant from the Royal Naval Benevolent [illegible] in a boarding house. Voted £25.

ADMIRALTY ORDERS

487.—Form S 220.—Report on Tuberculous Patients sent to Hospital.

(N. 156.—13.2.1926.)

[illegible] heading is to be substituted for Item No. 9 on Form S 220:—

[illegible] of Ships and Establishments in which patient has served, with actual dates of [illegible] service in each.

The form will be amended accordingly on reprint.

(K.R. and A.I., Article 1362 (2a).)
(A.F.O.s 226/25 and 1155/25.)

***535.—Salt Pork.—Removal from Standard Ration.**

(V. 400/3[illegible].—10.2.1926.)

Salt pork has now been removed from the scale of rations for H.M. Ships on all Stations [illegible] further issues to the Fleet will be made from the Victualling Yards.

[illegible] A ration of meat and vegetables (tinned) has been introduced as an alternative to salt [illegible] its accompaniments, when issued as the dinner ration, on the following scale:—

[illegible] meat and vegetables (tinned).

[illegible] potatoes (or 2 oz. haricot beans or Marrowfat peas when potatoes are not available).

[illegible] Until more experience has been gained of the extent of the current issues of meat and [illegible] (tinned) the bulk of the special reserve of fourteen days' sea victualling carried [illegible] H.M. Ships is to be in the form of corned beef and accompaniments.

[illegible] The necessary alterations in Appendix XVI of the King's Regulations and Admiralty [illegible] have been included in K.R. 11/19/25.

587.—Venereal Diseases.—Lantern Lecture.

(N. 492/26.—25.2.1926.)

The following addition has been made to the catalogue of the Lantern Lecture Establishment:—

NAVAL PROFESSIONAL LECTURES

Catalogue No.	Subject	No. of Slides	Brief Description	For whom intended
1 C	Venereal diseases	37	Venereal diseases, history, results, prevention and treatment	Officers and men

(A.F.O. 445/26.)

NAVAL MEDICAL COMPASSIONATE FUND

Account of Receipts and Payments for the year ending December 31, 1925

	£ s. d.	£ s. d.
Balance at Bank on January 1, 1925 —		
Current Account	93 1 2	
Deposit Account	Nil	
		[illegible] 1 2
Dividends on Consols	226 13 10	
Interest on War Stock and Bonds	35 0 0	
Interest on Conversion Stock	45 17 9	
		371 10 6
[illegible] —		
[illegible]	1 1 0	
[illegible]	159 10 6	
[illegible]	2 – 0	
		181 11 [illegible]
		[illegible] 5

		£ s. d.
Awards to Orphans and Widows		374 0 0
Secretary's Allowance		30 0 0
Auditor's Fee		– 3 11
Purchase of 300 3½ per cent. Conversion Loan Stock		288 6 0
Bank charges		3 4
Income Tax paid to Collector of Taxes in respect of holdings in War Stock and Bonds —		
1924/25	£[illegible] 17 6	
1925/26	7 19 [illegible]	
		15 15 0
Refund to Accountant-General of the Navy of cost of Railway Warrants issued to Devonport and Portsmouth Delegates appointed to attend the General Meeting of the Fund		4 15 0
Balance at Bank on December 31, 1925 —		
Current Account	[illegible]	
Deposit Account	Nil	
		[illegible] 5 8
		[illegible] 2

[illegible]

[illegible] in addition to the above Cash Balance [illegible] ... of the accounts at the Bank of England [illegible] ...

£1,000 [illegible] per cent. Consols

[illegible] per cent. War Loan Stock 1928/1947

[illegible] per cent. Conversion Stock

[illegible]

Notices

[illegible] Officers to send [illegible] original Papers [illegible] personal experience [illegible] Items of [illegible] Naval Medical Service will be welcomed [illegible] honorarium [illegible]

[illegible] published in the Journal [illegible] the property of the [illegible] copyright [illegible]

[illegible] Marriages and Deaths are inserted free of charge [illegible]

All Communications should reach the Editors on or before the 1st of the month preceding the date of issue Unless clearly written, they should be typed in order to avoid mistakes and they should be addressed to the Editors, JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE, Medical Department, Admiralty, London.

The JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE is published quarterly, four numbers comprising one volume.

The Subscription is 20s. per annum (postage included), payable on January 1 of each year, but should a subscriber wish to commence at [illegible] quarter he may do so by payment at the rate of 5s. per copy. All subscriptions are payable in advance. Single copies can be obtained at [illegible] per copy. Cheques or Postal Orders for Subscriptions should be crossed "Lloyds Bank, Ltd.," and be made payable to the Manager, JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE, Medical Department, Admiralty, London, to whom all communications relating to subscriptions, &c., should be addressed.

The payment of subscriptions by Banker's Order is recommended as it relieves the Subscriber of the necessity of forwarding a cheque each year and simplifies the keeping of accounts.

Journal
of the
Royal Naval Medical Service.

Original Articles.

VENTILATION IN H.M. SHIPS FROM THE EARLIEST TIMES TO THE PRESENT DAY.[1]

By Surgeon Commander T. B. SHAW, M.B., R.N.
Professor of Hygiene, Naval Medical School, R.N. College, Greenwich.

ERRATA, JANUARY, 1930.
Vol. XII, No. 1.

[illegible]

[illegible] were of short duration and the men when they were on board lived largely in the open air. When sails began to oust oars as a means of propulsion, ships were built larger and decks were introduced. About the year 1000 as far as we can ascertain there were quite a number of decked ships in the Navy, although in the early part of the eleventh century the majority were still of the galley type and decking was only partial. The question of ventilation in our ships did not really arise until about the beginning of the sixteenth century, by which time ships had increased much in size and officers and men were housed between decks. The increase in

[1] Presidential Address, December 15, 1925. Naval Military and Air Force Group, Society of Medical Officers of Health.

Notices

[illegible] Medical Officers [illegible] Papers [illegible] personal experience [illegible] the Naval [illegible]

[illegible]

[illegible]

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All Applications for Advertisements to be made to —

VOLUME XII [illegible] No. [illegible]

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By Surgeon Commander T. B. SHAW, M.B., R.N.
Professor of Hygiene, Naval Medical School, R.N. College, Greenwich.

I have chosen as the subject of my address on this occasion one which of all questions in Naval hygiene is the most important, viz., ventilation. I have decided to deal with this important subject historically, not only because this aspect is so full of interest, but because it is essential if we wish to appreciate and understand a subject thoroughly to know something of the pioneer work carried out by others in the same field.

I propose, therefore, to try and trace through the different ages of the Navy the various problems in ventilation which were met with as new types of ships were evolved, and to describe as far as time will permit the measures which were introduced by our forebears to deal with them.

In the very early days of the Navy our ships were not used as permanent habitations in the sense that they are now. They were undecked, voyages were of short duration and the men when they were on board lived largely in the open air. When sails began to oust oars as a means of propulsion, ships were built larger and decks were introduced. About the year 1000 as far as we can ascertain there were quite a number of decked ships in the Navy, although in the early part of the eleventh century the majority were still of the galley type and decking was only partial. The question of ventilation in our ships did not really arise until about the beginning of the sixteenth century, by which time ships had increased much in size and officers and men were housed between decks. The increase in

[1] Presidential Address, December 15, 1925, Naval, Military and Air Force Group, Society of Medical Officers of Health.

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size in our ships was a natural evolution to make them more seaworthy [illegible] the work—then just beginning—of building the Empire and the sub[illegible] into decks was necessary to accommodate the progressive increase in [illegible] ment and complement which were required About this time natural ventilation was hampered also by the further encroachment on the [illegible] spaces on board made by the introduction of cabins and storerooms The Elizabethan seaman Raleigh must have realized at this early period the value of fresh air when discussing the accommodation in the ships under his charge he wrote "Men may not expect the ease of many cabins and

[illegible]

safety at [illegible] that [illegible] sickness in [illegible]

With the [illegible] import ance in the [illegible] teenth century [illegible] propulsion and [illegible] ok the place [illegible] So that during the sixteenth, seventeenth and eighteenth centuries—a period of almost un ceasing naval activity—the conditions affecting the state of the air in our old wooden men of war remained much the same Port holes were first [illegible] in the *Great Harry* built in the reign of King Henry VIII a beautiful model of which can be seen in the museum at Greenwich These openings in the ships sides made for the guns, which formerly were carried on the upper deck only, increased greatly the natural ventilation between decks, but many years were to pass before any special methods were introduced to remove foul air from the ships or to increase the supply of fresh air The position as regards ventilation during this period may be inferred from words used by Gilbert Blane when discussing the prevention of disease in the Navy Writing in 1822 he states "It does not appear from the history of ancient times nor of modern times until very lately that the means of preserving the health of those engaged in war whether by land or sea was either studied or understood "

It was not until about the middle of the sixteenth century that English ships went far afield and although long voyages were made about this time by small squadrons composed of comparatively small ships such as those which sailed to the West under Drake and Hawkins, it was not until after the Dutch wars that our battleships or ships of the line began to go abroad But although with the gradual increase in size of the ships and the increase in the number of decks and compartments natural ventilation became more and more insufficient, many years passed before any thought or consideration was given to ventilation in their construction

Ventilation on board these early wooden ships was entirely natural and totally inadequate In harbour with all ports and hatchways between decks open, the air supply for the majority of the living spaces was probably sufficient but at sea when all ports had to be closed except in the finest weather and hatches had frequently to be battened down, we can readily understand the air conditions which must have prevailed in the crowded spaces between decks Writers of the time have described the atmosphere on board the ships at sea as appalling

Besides the overcrowding and deficient ventilation there were many other conditions present in our early ships which added greatly to the vitiation of the air The ships were damp bilge water was often foul and penetrated the whole ship with its odour The men had no proper kit and frequently were without change of clothing washing facilities were meagre, due not only to the very restricted water supply but also to lack of soap and candles used for lighting purposes polluted the air To ensure a supply of fresh meat when at sea live stock were frequently carried on board In the line of battle ship cattle and sheep were quartered on the middle deck in the after part of which was the gunroom and right forward the hawsers which led through the hawse pipes and passed over a combing which enclosed a space called the manger This space was often used to accommodate live animals which besides encroaching on space already overcrowded fouled the decks with their excreta and added still further to the pollution of the bilge water The bilges about which we hear so much in those days were a constant source of trouble in the old wooden ships and the nuisances caused by them were great The following extract from a nautical ballad written in the reign of Henry VI which pictures a voyage in a passenger ship of the day, describes very forcibly the bilge nuisance Rendered into modern English it reads "Presently the Captain summons the carpenter to make cabins here and there with a number of small bunks A sack of straw, said the master, would be well here for some have to lie down in their cloaks I would as soon be in a wood without meat or drink for when we turn in the pump will be close to our bed head and the man who breathes the stench of it were as good as dead" The ballast which was necessary in the wooden ship was also frequently dirty, and dry rot and decaying wood all helped to contaminate the air It is with feelings of wonder and admiration that one dwells on the conditions under which our seamen lived and fought and conquered in the early days of the Navy and even up to the beginning of the nineteenth century, before science had pointed the way to those measures which have since done so much to make

Fig 3 —Frigates of about Trafalgar period.

ship life a healthy one But as we readily understand now the death rate from disease was heavy and our Empire was built up at a great cost in [illegible] All the conditions were present for the spread of disease which during these times was frequently brought on board by men recruited from the gaols and lowest haunts on shore, and drafted to ships without suitable examination or disinfection

Although hygienic conditions were potentially very bad, we read of many cases in which ships in these early days of our Navy, by the wise direction of their captains and medical officers, were kept clean and wholesome and remarkedly free from disease Our great sailors, almost without exception, were always concerned for the health of their men The renowned navigator and famous British seaman, Captain Cook, whom we must regard as a pioneer in naval hygiene, showed the world one hundred and fifty years ago how much could be done even under the conditions then prevailing in our ships to safeguard the health of the sailor

The measures employed by Cook to prevent disease in his famous voyage round the world in the *Resolution* are described very fully by him in a letter dated March 5, 1776, which he wrote to Sir J. Pringle. In this letter we read that "The men were at three watches except upon some extraordinary occasions and they had generally dry clothes to shift themselves when they got wet. Proper methods were taken to keep their persons, hammock, bedding, clothes, &c., constantly clean and dry. Equal pains were taken to keep the ship clean and dry between decks. Once or twice a week she was aired with fires, and when this could not be done she was smoked with gunpowder moistened with vinegar and water. I had also frequently a fire made in an iron pot at the bottom of the well which greatly purified the air in the lower parts of the ship. To this and cleanliness as well in the ship as amongst the people too great attention cannot be paid; the least neglect occasions a putrid offensive smell below which nothing but fires will remove." As a result of these measures and others relating to food and fresh water, which are also set out in the letter quoted, the *Resolution* made a voyage which lasted three years and eighteen days with the loss of one man only from disease.

This voyage of Captain Cook was a great achievement and did much to stimulate and encourage hygienic measures in the Navy generally, especially as regards dryness, cleanliness and ventilation. Dampness between decks was corrected by the use of portable fires often called bogies and much was done to lessen the vitiation of the air by maintaining a high standard of cleanliness both in the ships and men. We read of many methods which were used in these early days to try and purify the air or at least remove the smells. A method which was considered most useful was the immersion of red hot irons in buckets of tar. A preparation consisting of gunpowder soaked in vinegar and then ignited was also used, also sulphur fumigation. By such means our forebears strove to alleviate their lot.

We have seen that no arrangements were made in the construction of the ships for ventilation but that air could enter through gun ports, scuttles, and hatches when open. It should however be noted that the frigate or cruiser of the period carried guns on the upper deck only and in this class of ship there were no gun ports, only scuttles or small slits in the side which had to be closed when at sea except in the finest weather. Although we have little information as to the relative incidence of disease in the various classes of ships at this period, we know that at the time when steam was first introduced in the early years of Queen Victoria's reign, the highest mortality occurred amongst those serving in frigates and corvettes; it was lower in ships of the line, but lowest of all in steam ships in which, as we shall see, air conditions were much improved.

The gun ports when first introduced were circular in shape but later they were made square and were fitted with hinged wooden lids which opened outwards. At a still later period circles of thick glass were fixed in the lids by means of which a certain amount of light was admitted when the ports had to be shut

The French were much ahead of us in ship building in these early days during the long struggle for supremacy at sea Writers of the time tell us that the best ships in the English Navy were those which had been captured from the Spanish and French But apart from the finer proportions of the ships built by the French, and their better sailing qualities we know also that in their line of battle ships the lower tiers of gun-ports were placed much higher out of the water than was the case in our ships This lower tier of ports was for all intents and purposes the only means of ventilation of the lower deck space into which they opened, and in our ships the openings were so near the sea level that it was frequently

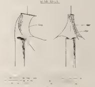


Fig. 3

necessary to close them when under way, and so this valuable aid to ventilation when most required was entirely shut off The danger incurred in keeping these ports open was well illustrated in the case of the *Mary Rose* one of our great ships in the reign of Henry VIII which was lost at Spithead in 1545 when proceeding with the fleet to meet the French Her lower tier ports were only about eleven inches clear of the water, and when the helm was put hard over these openings were submerged and the ship filled and sank with the loss of most of her crew In the excellent account of Anson's famous voyage round the world (1740) written by his chaplain Walker, we read that seventeen days after leaving Madeira the air between decks had become so vitiated owing to the necessity for keeping the lower ports closed that Anson ordered six air scuttles to be cut in each ship in such places as would least weaken it

For many years the only aid to ventilation in our ships, apart from [illegible] and hatchways which were primarily [illegible] purposes was the windsail. This appliance for increasing the [illegible] natural ventilator the wind is too well known to require [illegible]. The principle was used by the early Egyptians in the [illegible], which is still seen in Egypt which is erected on the roof of [illegible] and so arranged that it opens at the top in the direction of the prevailing winds and conducts the air to the interior of the dwelling. It is uncertain whether the windsail is an adaption of the *mulgaf* or whether its [illegible] tion on board ship was a natural sequence to the recognition of the [illegible] deflection of wind or draught which is caused by the ship's sail.

The windsail in the days before any form of artificial ventilation was used in our ships must have been invaluable but it had many limitations. It was naturally of no use in calm weather in the sailing ship, and in wet and stormy weather when the hatches were closed it could not be shipped. In our ships on tropical stations windsails are still frequently employed, and during calm weather at sea, when the wild heat from engine and boiler rooms still further raises the temperature of the air on board, they add greatly to the comfort of the men between decks. It is interesting to note that in former days when it was believed that "fevers" were caused in some way by emanations from low-lying air the windsails for use in hot climates, especially on the west coast of Africa, were made very long so that higher and as it was then thought purer strata of air could be drawn upon. I can find no mention of the windscoop, the device for attachment to scuttles in order to divert the air between decks, having been used during the days of sail. It would appear that this aid to natural ventilation was first used in our ships about 1870.

When studying the early medical history of our Navy one is surprised to find that so long a period passed before any mention is made of the introduction of fixed cowls on deck connecting with ventilating trunks leading to the decks below. The extensive use of the windsail which indicated the principles involved should have shown the desirability of these further measures for increasing the supply of air to the spaces and compartments between decks. It was not, however, until the closing years of the eighteenth century that the fixed cowl—at first made of wood—and its connections to decks below were introduced and then only in a very few ships. We must, however, remember that ship building then was not what it is now, and although the desirability of increased ventilation had long been recognised it was probably also realized or feared that additional openings in the deck would diminish the safety of the ship and that the cowls and trunks would interfere materially with the movements of the men working the guns or attending to the sails. We would appear in the end to have borrowed the idea of the fixed cowl from the French who at this period especially showed great skill and inventive genius in their shipbuilding.

Although no change took place in our ships as regards facilities for ventilation until the early part of the nineteenth century with succeeding years we find that the air conditions on board were much improved by greater attention to cleanliness and a fuller use of the ventilation available. In 1781 Sir Gilbert Blane represented to the Admiralty the importance of cleanliness good ventilation, and the prevention of dampness on board ship. Owing to the initiative of this pioneer in hygiene, soap, which hitherto was only with great difficulty obtained in our ships was provided as an issue on repayment. Although in 1750 there was a standing order that ships were to be kept properly aired it was not until the year 1806 that the naval regulations contained an article calling the attention of commanding officers to the importance of cleanliness and ventilation. We read of the rapid fall in sickness in the Navy in 1796 following the introduction of lime juice as a prophylactic against scurvy. Another marked fall in the sickness rate occurred in the early years of the nineteenth century this is attributed by Blane to the improvements in methods for promoting ventilation and cleanliness coupled with a stricter discipline

In the early days of the Navy the teredo worm caused great ravages in the wooden walls of the ships and not only increased dampness and the general discomfort on board, but frequently after long voyages brought about such wide destruction of the planking that the safety of the vessel was endangered. Columbus in his account of his first voyage to the New World gives us a good picture of the damage done by the teredo "My ships were pierced with worm holes like a bee hive and with three pumps and the use of pots and kettles we could scarcely with all hands clear the water that came into the ship there being no other remedy but this for the mischief done by the ship worm." Sir Richard Hawkins also, who in his "Observations on a Voyage into the South Seas" in 1588 discusses at length on many problems affecting ships and mariners of the period gives a long and interesting account of the ship worm and how to protect ships against it. The best method then in use he tells us was that invented by his father (the famous Sir John Hawkins) which consisted in sheathing the oak timber of the ships with elm ½ in thick laid on a layer of hair and pitch. But this procedure, although it gave a certain amount of protection against the worm did not completely prevent it, and our ships continued to suffer from the destructive action of this pest until the introduction of copper sheathing

Sheathing the bottom of the ships with copper which was first carried out in a frigate in 1761 is an important landmark in ship construction not only from the point of view of seaworthiness but also hygienically. The sheathing increased the speed of the ships preserved the timbers and enabled them to keep the sea for longer periods without docking it also diminished leakage and the resulting dampness on board by preventing fungus and dry rot. Coppering was extended to line-of-battle ships in 1779 and by the end of the eighteenth century all our ships were protected by this sheathing

Another change in the internal economy of our ships which improved greatly the air conditions on board was the introduction towards the end of the eighteenth century of slabs of iron known as pig iron for use as ballast Up till this time the ballast had consisted largely of gravel and sand which always contained a certain amount of organic matter and this by its decomposition fouled the bilge water and increased the contamination of the air on board About the beginning of the nineteenth century also the foul odours resulting from the bilge water were much alleviated by an improvement in ship construction introduced by Sir Robert Seppings Surveyor of the Navy Cavities under the floor of the hold which acted as receptacles for filth and vermin dead and alive were properly filled up and intervals were left between the timbers of the ship to allow foul air to

Fig 4

pass up from the bilges through the channels thus formed in the ship's sides and escape into the open air

It was early recognized by naval medical officers that some form of artificial ventilation was required, and as our ships became more complex in structure the desirability of additional ventilation became more and more apparent, but although many ingenious contrivances were submitted and tried by various inventors it was not until the introduction of the steam fan in 1867, that a satisfactory solution of the problem came in sight Some of the appliances used in the early attempts at artificial ventilation are of more than passing interest, and a brief account of them will therefore be given here

The first mechanical air propeller was the rotatory fan invented by Desaguliers in 1734 This fan or rather wheel from which has developed our wonderful modern electric fan, was seven feet in diameter and one foot in width It was enclosed in a casing into which air entered at the cent[illegible] at the circumference [illegible] called his machine a [illegible] wheel but the [illegible] costs [illegible] men were required to work it and although in the year [illegible] the apparatus was actually installed and tested in [illegible] ships (H M S *Arundel*) the trials were not considered satisfactory and it was not approved

In May 1741, Dr Stephen Hales, a clergyman, in a paper read before the Royal Society described a method of ventilation by means of an apparatus which he called the "ship's lungs" This apparatus was cumbersome and clumsy and although it was installed with certain modifications in several of our ships in actual practice it proved of little or no value, and was soon discarded The principle involved in Hales' invention is readily understood on referring to the diagram The "ship's lungs" were two large boxes containing movable diaphragms which could be operated like bellows by means of vertical bars attached to a cross handle acting on a central pivot The boxes had valvular openings at either end through

FIG 5 —Perkins apparatus

which air was drawn in and expelled as in the case of ordinary bellows To us now the ship's bellows appears very crude and hardly worthy of consideration the apparatus could do little more than stir up the air, but it is of interest to note that it was spoken highly of at the time by Lind

In the early part of the nineteenth century an ingenious method of ventilation, which in those days before the advent of steam and electricity had the great advantage of being automatic, was introduced by Perkins The apparatus consisted essentially of two tanks half filled with water and connected below by a pipe so that the water could pass from the one to the other From each tank a hosepipe led from its upper part down into the space to be ventilated, and a pipe also led from each tank to the outer air, the pipe openings into the tanks were controlled by valves As the ship rolled and the water passed from one tank to the other foul air was alternately drawn up from the hold by one tank and expelled again into the outer air by the other and *vice versa* Perkins apparatus and other modified forms of the same device were actually fitted in several of our ships but they did not prove of much practical value

A naval surgeon, [illegible] Magill of H M S *Thetis*, tells us what he thought of Thomas's ventilating bilge pump, an apparatus similar in principle to that invented by Perkins "The action of the system is very simple and the theory very plausible but the actual work done is small indeed and on occasions when ventilation is most required it is altogether inactive" These devices failed because their efficient action depended upon frequent and wide movements of the vessel and a ship was not constantly rolling

Various forms of air-pumps were also experimented with in the endeavour to alleviate the foul air conditions on board McDonald in his 'Naval Hygiene' published in 1881 describes a ventilating pump invented by Dr Arnott, F R S, but although appliances of this nature are mentioned by several writers I can find no evidence to show that they were much employed in our ships In his 'Life of Lord Anson' published in 1839, Barrow refers to a machine invented by Captain Warrington of the East India Company's Service which produced a constant and complete ventilation 'It is on the principle of an air pump' he states, 'and the vacuum is produced by one man turning a windlass by which the foul air rushes out with a blast as strong as that from a waste-pipe, or safety valve of a cylindrical bellows in a forge or smithy'

As has already been indicated it was not until the early part of the nineteenth century that the principle of the windsail was extended and cowls first came into use in our ships Cowls were however not very widely employed until the advent of the iron ship The introduction of the fixed ventilator or cowl soon led to a further advance in ventilation—the employment of shafts or air tubes as they were then called in order to distribute the air coming down the ventilators more widely throughout the ship but here again it would appear that little use was made of these ventilating shafts until the introduction of the iron ship The general rule in the days of the wooden ship appears to have been to supply one cowl only which was placed generally in front of the foremast a part of the upper deck where no hatches were present Blane in his 'Dissertation on the Health of the Navy' tells us that all ships were now fitted in this manner, but in a large model of the *Queen* battleship, built in 1839 now in the museum at Greenwich no ventilator is shown and no mention is made of fixed cowls in an account given of the ventilation in H M S *Agamemnon* launched thirteen years later There is no doubt, however, that fixed ventilators were fitted at this period in our ships and we know that cowls were not always shown in ships' models, but it is probable that only too frequently the ventilators were removed and plates screwed down over the openings through the decks a practice which is not unknown even at the present time

It was fortunate that the Navy from the middle of the eighteenth to the early part of the nineteenth century was able to draw upon the services of such medical officers as Lind Blane and Trotter These men, of whom Lind was perhaps the most original, were all pioneers in hygiene and did and in spite of the great difficulties with which they had to contend to make ships far more healthy Their views on ventilation were all much in advance of the times and although none of them lived to see the complete accomplishment of their recommendations their work did much to educate the naval officer of the day in the elementary principles of hygiene and prepare the way for the necessary changes Trotter was continually talking and writing on the question of ventilation and made many useful suggestions on the subject He pointed out the necessity for increasing the air supply between decks by means of additional openings provided with suitable cowls which could be trained to the wind "We find no objection" Trotter says, "as far as we have conversed with officers to their introduction throughout the Navy they can be so constructed as to be clear of the guns and ropes and when we consider the great advantages of pure air to life and health we ardently wish to see the trial

With the advent of steam, which was a means of solving many problems in naval hygiene further progress was made in ventilation At this period before the steam fan was invented we find that those who were working on ventilation directed their efforts more to the extraction of foul air than to the supply of fresh air Mechanical devices for the renewal of air such as the wooden wheel and Hales bellows had failed as we have seen because of their crudeness and the labour involved in their use even the principle of the Archimedean screw had been adapted later by Dr Reid and was actually used in the ventilation of our ships which took part in the Niger expedition but this also proved unsatisfactory The great necessity for improving the air conditions in our ships was therefore widely recognized and every suggestion or idea on the subject was keenly exploited The day of the steam-fan, however, had not yet arrived and for several years after the first of our ships fitted with auxiliary engines was launched extraction methods of ventilation were used in preference to the propelling system which so far had proved so difficult of application

The principle of the extraction method or exhaustion of foul air had been employed for many years in the Navy Writers in the eighteenth century tell us how the air was purified by burning fires in the hold a method suggested by Sutton in 1740 and this practice was undoubtedly of great value in getting rid of the foul air which accumulated in the depths of the ship The principle was carried further about the middle of the nineteenth century when special air shafts were constructed with the aid of which air was removed from compartments by reason of the draught which was created by lamps or stoves placed inside This method was, however not very generally used

Extraction by means of steam seems to have been introduced by Edmonds a naval surgeon who was also the originator of an improved system of ventilation by means of cowls and trunks In this system use was made of double ventilating shafts so arranged as to allow fresh air to pass down between decks and also to permit of the exhaustion of foul air

To aid in the removal of foul air, Edmonds had pipes led from the boilers into up take shafts where they ended in metal rings, and thus powerful steam jets were available to act as exhausters

The most valuable extraction force which became available, however when our ships were fitted with steaming plants was the draught up the funnels from the boiler fires. This was of great value in the early days of steam before ships were much subdivided into compartments, and in certain cases special exhaust tubes were led into the funnels in order that this valuable extraction force could be more widely used The heat generated by the products of combustion passing up the funnel was utilized still further by the introduction of what was called the funnel casing The funnel casing which was devised by Mr Baker was made of iron plates and as its name implies, it enclosed the funnel but it also surrounded the upper part of the boiler When the boilers were in use and the air in the

FIG 6 —H M S *Rattler* to the left—a sloop of 1 078 tons

spaces enclosed in those casings which were of course open above and below was heated a continuous upward movement of large volumes of air was maintained

The steam engine was invented by Watt in 1769 In 1815 the first war ship propelled by steam built by Robert Fulton for the United States Navy was launched We were very slow to adopt steam in our Navy Naval officers in the early transition period regarded the steamship as something unique but still not to be compared with the sailing ship But as time went on and the steam merchant ships were improved and increased in numbers the superiority of steam over sail became evident to all

The paddle-wheel sloop was the first type of steamer used in the British Navy, but the paddle wheel soon gave way to the screw Our first screw vessel was the sloop *Rattler* built in 1843 The *Agamemnon* launched in 1852 was the first line-of battle ship fitted with the screw propeller, but at this period it must be remembered that steam was merely an auxiliary to sails, and some years passed before the latter were gradually ousted and in turn became subsidiary to steam.

Let us consider for a moment the ventilation available in our ships during this transition period from sail to steam as seen in H.M.S. *Agamemnon*. The medical officer of this ship (Dr. A. Graham) then in the Mediterranean wrote amongst others the following remarks on ventilation in his journal for the year 1860:—

"Great care has been taken by the chief engineer to keep the bilges scrupulously clean and dry. They are regularly whitewashed and the chloride of zinc frequently sent through them. The decks are holystoned once a week and regularly scrubbed every morning, except during damp or wet weather when the lower deck is not wetted. Warm water is merely sprinkled on the orlop deck (the lowest one) every morning and immediately

[illegible] H.M.S. [illegible] Battleship [illegible] tonnage 3,102

afterwards it is scraped so that with the assistance of windsails it dries in a very short time.

"On the orlop deck the ventilation is obtained by means of windsails and scuttles. There are four hatchways down three of which windsails are led, the other not being available on account of ladders. The other one is principally for the use of the engine room but it also serves to ventilate the after cockpit and bread room. The foremost windsail is of great use and is led into the boatswain's and carpenter's storerooms which are thus always kept cool and sweet. The centre one is down the main hatchway for the benefit of the centre part of the ship. The scuttles are 8 in. in diameter but they can only be kept open in moderate weather and being principally placed in the officers' cabins are not of very great use in the ventilation of the deck. The stokehold is ventilated by four large metal tubes led down from the deck and also by the after windsail."

With regard to the ventilation of ships in general Graham remarks

"It must be [illegible] considering the [illegible] of the present age, it is not in so satisfactory a state as could be wished and so far as I know few attempts have been made to improve it within the present generation" He considered that now when steam was available some methods might be devised to disperse the air more generally throughout the ship by means of a small engine As we shall see, the steam-fan was introduced seven years later

Another important landmark in the development of the Navy which led to many changes in the system of ventilation was the introduction of the iron ship The days of the wooden ship ended in 1861, when H M S *Warrior*, our first ship built entirely of iron, was launched The iron ship was much better hygienically than the wooden ship There were now no questions of dry rot perished timbers, leakage and excessive dampness, and the nuisance arising from the bilge water was almost entirely removed not only because of the absence of decaying wood and leakage but also because

[illegible] *Warrior*, [illegible], c 050

efficient steam pumps replaced the hand pumps with which hitherto the bilge accumulation had been [illegible] difficulty removed

With the advent of the iron ship, however, an important modification in construction took place which as time went on became more and more marked this was [illegible] compartments The old wooden ships had deck spaces which were freely open from end to end and unhampered save for the guns mess tables and other small gear, and which in harbour were ventilated naturally by the numerous gun ports As the steamship developed, open spaces became more and more encroached upon and the supply of air was further restricted because fewer port holes were required as guns increased in power and size and diminished rapidly in numbers Ventilation therefore by means of fixed cowls connected with trunks leading to the different compartments had to be more widely used and the furnaces and funnel casings became still more necessary as means of exhaust About this period also was introduced the principle of aiding exhaust ventilation by means of pipes which led from the roof of compartments to end in goose-necks on the upper deck

When considering ventilation it must always be remembered that we have to deal not only with the renewal and removal of air to and from compartments but we have also to maintain the air in these spaces at a suitable temperature. In the old wooden ships, the sides of which were bad conductors of heat, the temperature between decks was fairly equable. In iron ships the opposite conditions obtain, and as the use of steam, which was at first employed only for the main engines, became more general and numerous auxiliary engines were added to ships, the high temperature of the air which resulted in many living spaces became a factor of great importance with which it was necessary to deal. The heat which is thus generated on board ship has been called "wild" heat because it is so difficult to control. In the early days of the iron ship the supply of air then available was insufficient to counteract this wild heat, but great progress was made in this direction when the mechanical fan was introduced,

Fig. H.M.S. *Hercules*

and during recent years the excessive heating of living spaces has been further curtailed by lagging not only steam-pipes as they pass through different parts of the ship but also when necessary decks and sides of compartments with non-conducting material.

The mechanical fan which is such an important factor in the ventilation of our modern ships was first used in the Navy in the stokehold of H.M.S. *Hercules* in 1867. A few years later a change took place in ship construction which made the introduction of the steam-fan, already some years overdue, an absolute necessity. This change was the lowering of the freeboard which produced ships of the monitor type. These ships which floated only a few feet above the water presented small targets to the enemy, but their ventilation by natural means was quite impossible, and so with the advent of the monitor we meet for the first time in the Navy with that plenum system of ventilation upon which we still so largely depend.

One of the first [illegible] H.M.S. *Dreadnought* [illegible] below. After [illegible] the *Dreadnought* [illegible] [illegible]

In the [illegible] fan [illegible] [illegible] trunks. [illegible] comparatively small [illegible] through [illegible] first of [illegible] very bad. In the [illegible]

Fig. 10.—H.M.S. [illegible] 9 300

many bends in the air [illegible] compartments were placed [illegible] the air. In later ships [illegible] ventilation was much improved [illegible] when closed down at sea was [illegible] satisfactory and [illegible] until the number and power of the [illegible] were largely increased.

To ensure the safety of the ship in the case of flooding, [illegible] valves were at this period fitted [illegible] trunks where they pierced [illegible] tight bulkheads. Improved [illegible] valves known as [illegible] Broadfoot's were introduced in [illegible] the former was used where [illegible] trunk penetrated a vertical partition, the latter where it passed through a horizontal one. By means of these valves, which closed [illegible] when water entered the air trunks, the passage of water from one compartment to another was prevented.

With the introduction of the electrically driven fan, first fitted in

P

[illegible] nd battleship [illegible] great adv[illegible] [illegible] advantages [illegible] its slow speed [illegible] also [illegible] the temperature [illegible] were [illegible] [illegible] instance [illegible] and [illegible] the same time [illegible] much larger [illegible] which they [illegible]

[illegible] still more [illegible] feature [illegible] with the [illegible] through them. When [illegible] ships and many

Fig. 11.—H.M.S. *Hogue*

[illegible] uld be employed the principle of single compartment ventila[illegible] [illegible] In this method of ventilation which is now in general [illegible] each compartment is self contained and is [illegible] with [illegible] is required for use in that compartment alone as far as [illegible] piercing of decks and bulkheads by air shafts is [illegible] but [illegible] has to be carried out watertight slide valves which [illegible] from the upper deck are employed

[illegible] the steam iron warship has been such that natural [illegible] more and more subsidiary to ventilation [illegible] The extensive subdivision into compartments has [illegible] armour has increased to such an extent [illegible] ports and scuttles are no longer available in [illegible] mess decks and accommodation in the living [illegible] restricted. The electrical fan however, the [illegible] greatly increased has been able to cope with [illegible] fans were employed [illegible] H.M.S. [illegible] the first plenum ventilating system [illegible] the extent of the system in a modern [illegible] ship [illegible] it is recognized that in the latter [illegible] and [illegible].

The [illegible] natural draughts in ventilation has [illegible] a still [illegible] one. [illegible] striking the body [illegible] natural ventilation [illegible] velocity comparatively low [illegible] increased when [illegible] employed to supply the [illegible] the increasing [illegible] and the necessity for larger volumes [illegible] the prevention of [illegible] in modern ships has become [illegible] difficult. It [illegible] that the sailor dislikes [illegible] not strictly [illegible] and now realizes it [illegible]

[illegible]

[illegible] by [illegible] should [illegible] which is [illegible] street [illegible] other [illegible] even in the [illegible] months of the [illegible] the men sleeping [illegible] and [illegible] naval surgeon [illegible] middle of last century stated [illegible] disappear [illegible] people will not tolerate a draught [illegible] temperature. A [illegible] towards the solution of this problem [illegible] introduced into [illegible] ships.

Even before the advent of steam [illegible] heating of the [illegible] otherwise than by stoves was [illegible]. [illegible] obtain satisfactory ventilation in cold weather the air [illegible]

[illegible] ethod by [illegible] water [illegible] Whi [illegible] that [illegible] in cold weather, [illegible] first ship the battleship *King Edward VII* [illegible] heaters, was launched

The heating apparatus [illegible] class and still employed in our ships [illegible] by reducing draughts in living spaces [illegible] most valuable when efficiently used for [illegible] purposes. This heating

FIG. 11.—Diagram to illustrate system of [illegible] and ventilation

[illegible] essentially of a steel chamber [illegible] through which [illegible] be passed placed in the [illegible] supply fan. The temperature of the air delivered [illegible] hand lever by means of which the amount of air passing through the heater is controlled. When the temperature [illegible] is high and no warming is required the air is allowed to pass on without entering the heating chamber, the by pass to which is cut off. When [illegible] to heat the air steam is admitted to the pipes in the chamber and by means of the hand lever the by pass to the latter is opened as required to allow the necessary amount of air to pass through. In this way, by suitable adjustment of the lever, the temperature of the delivered air can be regulated.

W[illegible] first introduced it was thought [illegible] would [illegible] the volume of air supplied by the [illegible] experi[illegible] ago showed that the air supply, alth[illegible] affected provided too much [illegible] not p[illegible]. In temperate climates it [illegible] rarely [illegible] than one-third of the air through [illegible] heater [illegible] the extent was found to reduce the supply by [illegible] per cent. It is important to remember however that the [illegible] used by the heating apparatus and allowance [illegible] drawing up plans for the venti[illegible] of living spaces [illegible] the required amount of air per head must [illegible] forth [illegible].

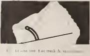
In the [illegible] heaters it was not generally recognized that for the [illegible] temperature of the air in living spaces should not [illegible] high as a result overheating was the rule rather [illegible] there were frequent complaints [illegible] stuffiness [illegible] not only to the temperature of the air but [illegible]. These two conditions of the air, temperature and dryness [illegible]. As the temperature rises the relative humidity lowers [illegible] reduced to such an extent that actual discomfort is caused. The body can accommodate itself to considerable variations both in temperature and humidity but only with marked discomfort and the possibility of injury to health when the variations are extreme. In the [illegible] excessive humidity was the bugbear. In our modern [illegible] combined heating and ventilating system is used we have to cope with excessive dryness. But dry warm air is not so depressing as warm moist air and although it has been suggested that moisture should be added to the air which is passed through the heaters this procedure is quite unnecessary provided steps are taken to prevent overheating, to the steam [illegible] and maintain a suitable temperature in the living spaces.

The committee appointed in 1912 to investigate the ventilation systems in use in H.M. ships found that the chief cause of the extreme dryness of the supplied air was due to overheating, which was essentially preventable and that the use of humidifiers was unnecessary. Overheating must therefore be guarded against by careful adjustment and supervision of the heating apparatus: the temperature of the air in living spaces should not be allowed to exceed 65° F. and preferably should be kept at about 60°–62° F.

When the combined heating and ventilating system was first introduced it was used in officers' cabins, but experience has shown that in these comparatively small spaces in which draughts can be almost entirely prevented by adjusting the movable air-inlets heating can be carried out more satisfactorily by electric radiators.

It has been suggested that the exhaust system of ventilation should be [illegible] but independent [illegible] system has [illegible] be in pl[illegible] are [illegible] the [illegible] question W[illegible] would be imp[illegible] vance[illegible] althou[illegible] [illegible] rater system [illegible] ship

[illegible] days of the Great War [illegible] made as a result of [illegible] This alterati[illegible] [illegible] the trunk by means [illegible] t of air passing [illegible] be regulated [illegible] deflectors [illegible] can be calculated



[illegible] [illegible]—Section [illegible] trunk [illegible]

[illegible] where N [illegible] the number [illegible] number of the deflector [illegible] you wish to [illegible] first deflector the nearest [illegible] open [illegible] for regulating the [illegible] advance in [illegible]

[illegible] the plenum system [illegible] ventilation has [illegible] was fully recognized than in certain places [illegible] could not be used without distributing [illegible] the living spaces are contaminated with foul or disagreeable [illegible] poisonous gases It is the custom therefore to [illegible] exhaust fans in such places as w.c.s, urinals and bathrooms [illegible] isolation cabins for infectious cases, galleys and bakeries [illegible] nt for the generation of carbonic acid (CO_2) used in [illegible] magazines and cold storage spaces artificial exhaust [illegible] is also fitted Another space which should [illegible] in [illegible] [illegible] enlarged [illegible] but [illegible] poor, a [illegible] deficiency in [illegible] with [illegible] content. [illegible] experiments which [illegible] carried out [illegible] Medical School, Greenwich [illegible] that [illegible] which is [illegible] for mixing the various paints rapidly removes oxygen from the [illegible] to the accumulation of CO_2. It is therefore important in [illegible] not only to have efficient exhaust ventilation but also to see that [illegible] containing oil are kept covered in such a way as [illegible].

Our knowledge of the deleterious changes which may take place in the air of closed or badly ventilated spaces has increased considerably during recent years. One hundred years ago [illegible] that [illegible] the well of a ship used to become so contaminated [illegible] in innumerable instances to produce instantaneous and [illegible] suffocation. In such spaces and

Fig. 15.—Type of [illegible]

compartments the oxygen diminishes and the CO_2 increases. [illegible] now know that these changes are brought about much more rapidly if the compartment, besides being badly ventilated, contains tobacco, potatoes or other vegetable matters. In [illegible] H.M.S. [illegible] a compartment under the latter conditions lost their lives. Experiments were carried out at Greenwich in order to try and ascertain the cause of death, as the actual changes in the air which were produced [illegible] conditions were not definitely known. It was found that when tobacco [illegible] was not enclosed in air-tight tins and other vegetable matters [illegible] if moist are stored in closed spaces the air is so to speak [illegible] the oxygen is used up and CO_2 is much increased. Strict regulations regarding the precautions to be used when opening up closed spaces and [illegible] the storage of tobacco and vegetables on board are now in force which should prevent further accidents of this nature.

Time will not permit to tell you in any detail of the many other advances in ventilation which have been made during recent years. [illegible]

[illegible] supply [illegible] ments in [illegible] than in [illegible] an ex[illegible] d then again into [illegible] but to [illegible] can be raised [illegible] mast of [illegible] four small [illegible] down [illegible] shown [illegible] indicated in the sketch whilst they [illegible] vent water from the seas which may be [illegible] their introduction represents a great [illegible] their use ensures a good supply of air [illegible] vessel when at sea in rough weather when [illegible]

[illegible] introduced during the war proved [illegible] ventilation when ships had to be darkened [illegible] in night operations at sea. The value [illegible] light is excluded but air can enter [illegible] by those of us who before they were supplied [illegible] brought about on board by the use of the [illegible]

[illegible] the development of the most important [illegible] —since its first introduction into [illegible] has always been attached to silent [illegible] has been very marked and with [illegible] been considerably reduced [illegible] in our ships are in four sizes [illegible] supply 1,200 1,800 900 and [illegible] Quite recently a new type [illegible] given very satisfactory [illegible] ships. This fan which [illegible] greater resistance than its [illegible] lighter in weight than the old pattern [illegible] the new fan which will assist [illegible] sufficient supply of air is that the [illegible] to run at full speed only. This is an important [illegible] it would appear to be desirable to be able to redu[illegible] will the number of revolutions of the fan per minute [illegible] naval [illegible] officers must know from experience how difficult it [illegible] the present fans which can be run either at half or full speed to [illegible] the maximum output of air owing to the desire to save the [illegible] by running them at the lower rate. During recent years also as [illegible] regarding the velocity of the [illegible] [illegible] has [illegible] [illegible] [illegible] ... should [illegible] quarter [illegible]

What our [illegible] over[illegible] fresh air [illegible] of the air [illegible] [illegible] essential [illegible] tropics is created by traversing fans. [illegible] circulators have been issued to our ships [illegible] living spaces and in such compartments as [illegible] which in use are crowded with men with [illegible] traversing fan also spoken of as a table fan [illegible] *punkah* has done for centuries in countries [illegible] cool by keeping the air in motion. This [illegible] further in what has been called the *punkah* [illegible] In this method of supply the air delivered [illegible] system is passed through special louvres [illegible] dispersed and directed to any desired quarter.

Punkah louvres have recently been tried [illegible] approval has been given to make use of them [illegible] of the wireless telegraphy compartment. [illegible] that punkah louvres may be used with advantage [illegible] where special conditions obtain, but for [illegible] ship our present system of plenum ventilation [illegible] the ordinary table fan is the most satisfactory.

However extensive or complete the ventilation installation [illegible] may be, its efficiency depends on adequate supervision and control. [illegible] point was stressed by the Ventilation Committee, and all medical [illegible] must realize its vital importance. Many years ago when the meth[illegible] air renewal were still of a very simple nature Trotter called attention [illegible] the grave conditions which resulted from lack of supervision. He tel[illegible] amongst the various omissions which contribute to the injury of the health of the crews of H.M. ships nothing seems more extraordinary than the general neglect there is of working the fixed ventilators." It must always be remembered that the maintenance of a satisfactory condition of the air on board ship is the most vital factor in naval hygiene.

A great advance was made in naval hygiene early in 1911 when orders were issued by the Admiralty which directed that in every ship a ventilation party was to be formed to supervise and control the working of the ventilation [illegible] the medical officer should [illegible] intervals the [illegible] in the various compartments. [illegible] ing the [illegible] now used in the Navy the whirling [illegible] by means of [illegible] accurate readings can be obtained [illegible] the old wet and dry bulb instrument. In 1923 the kata th[illegible] means of which [illegible] positive data as to the cooling power [illegible] under investigation [illegible] was issued to our ships [illegible] most important [illegible] determining the efficiency of ship venti[illegible] lation which [illegible] renewal of the air must be assured, is the estimation of the CO_2 content. The general application of this test was rendered [illegible] of Haldane's rapid method of estimating CO_2 for which only small samples of air are required. For some years it has been [illegible] that in the various compartments in our ships the CO_2 should [illegible] 12 parts per 10 000. During the past few years many hundreds of air samples from different ships have been analysed [illegible] the findings have shown very clearly how greatly the air [illegible] improved as a result of the orders issued for the [illegible] supervision of the ventilation. In the first hundred samples [illegible] were examined, following the orders issued in 1914, 48 per cent [illegible] more than 12 parts of CO_2 per 10,000; in the sixth hundred the [illegible] which contained CO_2 in this amount was only 8. The true [illegible] of these figures will be realized when we remember that the [illegible] of the air samples came from compartments in which the [illegible] were under suspicion. In living and working spaces on [illegible] we now very rarely find that the CO_2 exceeds 12 parts per [illegible] in the large majority of cases it is considerably below this [illegible]

[illegible] has been a tendency of late to attach too much importance to [illegible] condition of the air and neglect the question of purity. It [illegible] to me recently that in the light of our present knowledge [illegible] were now unnecessary when investigating air conditions. [illegible] recognize the great importance of maintaining a satis[illegible] physical condition of the air and the valuable information regarding [illegible] ventilation which can be obtained by the use of such [illegible] as the hygrometer and kata thermometer we must not [illegible] that adequate renewal of the air about which these instru[illegible] us little is also an essential in ventilation for the control [illegible] determination of the CO_2 content still remains our best guide. [illegible] air is necessary not only to ensure the tonic effects of [illegible] fresh air, but to remove impurities such as odours, dust [illegible]. The greater the number of air changes we can bring about [illegible] the less risk there will be of the spread of bacterial infection [illegible] planning ventilation systems in our ships we endeavour to [illegible] an air supply of 3 000 cubic feet per head per hour in all living [illegible] spaces.

[illegible] which [illegible] ship especially [illegible] rate. The [illegible] diminished considerably remained high until the advent of steam and the introduction of the iron ship which has we have been led among other things to more efficiency in ventilation. During the three year period 1859 to 1861 the average death rate from disease was 11.5 per 1,000. In 1861 the first iron ship was launched and during the period 18[illegible] to 1861 the average yearly [illegible] had fallen to 8.5. This still continued with few remissions during succeeding years and in 1912 the death rate had declined to 1.47 per 1,000 which is the lowest figure hitherto recorded. Although many factors in naval hygiene have been at work in bringing about this very satisfactory result, there can be no question that ventilation has been one of the most important, and we owe a deep debt of gratitude to all those medical officers, and they are many, who have done so much against great difficulties to ensure the best possible air conditions for our sailors when afloat.

SOME EXPERIENCES IN THE PREVENTION OF MEASLES

By Surgeon Commander B. PICKERING PICK, R.N.

Any medical officer, and especially those who may be employed in appointments where the personnel is largely composed of young and therefore probably susceptible individuals, may be faced with an outbreak of measles. The disease is such an important one, both by reason of its mortality and by the variety of its complications, that I believe every effort should be made to prevent its spread, and the old idea which still lingers that it is better to let the child have it and get it over should be sternly discouraged. The loss of time too caused by a large epidemic is important, and on this ground every effort should be made to prevent spread.

Our knowledge of the actual causative agent of some of these infectious complaints being what it is, the matter of prevention is at once one of difficulty. When the specific organisms of such diseases as diphtheria and enteric became known and means were at hand to locate them, the prevention of these diseases became a much simpler matter. As yet we do not recognize the specific organism of such diseases as measles and mumps. We imagine they are air-borne and that such diseases are spread by more or less direct contact, and it may be that when the particular micro-organism is known we shall be better equipped to deal with the situation. Our difficulties are further increased by the fact that in these diseases the first intimation we have of their presence is the appearance of the typical signs and symptoms of the disease in a patient, so that the damage has probably already been done. Boys will go to bed perfectly well and wake [illegible] or [illegible] that [illegible] however [illegible]

[illegible] one to [illegible] to appear [illegible] highly infectious [illegible] about—[illegible]

[illegible] the patient at the [illegible] Further it is quite [illegible] the patient. If [illegible] before the rash [illegible] complications are very [illegible] 110 cases, and in [illegible], I did not [illegible] was a prominent [illegible] pharyngeal and tracheal [illegible] had not been placed under proper [illegible] inflammation would have spread [illegible] resulted?

I [illegible] led me to decide that if ever an opportunity [illegible] try and obtain my cases early in [illegible] on the fact that these steps [illegible] of the first case. It is of no [illegible] number of cases which may be [illegible]. The aim should be that after [illegible] one have been gathered in there should [illegible] that to do this action must be taken on the [illegible]. If action is delayed till the second batch [illegible] the disease will have taken charge. In one [illegible] there were no less than twelve cases [illegible]. Happily they had been dealt with.

I [illegible] these lines when serving in one of the [illegible]. A small dance was given on board at which only [illegible] no cadets. The next day it was [illegible] had developed measles. All officers who had [illegible] the position explained to them, and were asked [illegible] at once. On the eleventh day after the [illegible] was sent for me on waking to say that he did not [illegible]. The ship was cruising at the time and the patient [illegible]. On the fourth day from the commencement of the [illegible] appeared. There were no other cases. The [illegible] hours instructing cadets in casemates and I [illegible] reasonable to suppose th[illegible] [illegible] [illegible] pent the first two [illegible] days of his illness [illegible] with the [illegible] grave risk of passing [illegible]

With this experience I tried to f[illegible] [illegible] On the occurrence of the first case [illegible] [illegible] In deciding [illegible] the individuals who are [illegible] [illegible] I p[illegible] a great deal of attention to the [illegible] [illegible] [illegible] whole [illegible] to the second [illegible] contact [illegible] be very [illegible] I am naturally regarding [illegible] question [illegible] of the training establishments and the question will vary [illegible] whether one is dealing with cadets or boy ratings [illegible] doubt it is as well to regard the case as [illegible] I might mention here that as soon as the term German [illegible] applied to cases of [illegible] is banished [illegible] the better [illegible] leads to confusion in the public mind

A basis for fixing on the potential cases may usefully be [illegible] as applying to cadets or the Division as applying [illegible] in *Impregnable* or even in the sea going ships

Having fixed on the number of potential cases the next [illegible] will arise is as to whether they can be withdrawn from [illegible] of the establishment and efficiently isolated or not [illegible] in considering the question must always bear in mind the [illegible] dislocation which he may cause that the cadet [illegible] specific purpose namely to be instructed and that a very [illegible] disturbance in the routine may and does have far reaching [illegible] carry out the scheme it must be thorough and with as few loopholes as possible Naturally the easiest way would be to isolate the party but there are other points of view and the medical officer is bound to consider them

The potential cases may therefore be isolated or not as circumstances allow

On the eighth day after exposure to infection the potential cases are mustered three times a day I think it most important that the first muster should be on first turning out Catarrhal signs are looked for as is the presence of a rash, the mouth and pharynx are examined and inquiries made as to any symptoms As will be apparent later these symptoms will often be wanting although certain other circumstances may have arisen which make stricter dealing with the case imperative Lastly the body temperature is carefully taken and recorded I need hardly emphasize the need for accurate instruments and careful reading of the results If any case shows the slightest rise of body temperature he is isolated from the main body, even though he has no signs or symptoms It is well known that even quite moderate exercise raises the body temperature temporarily but I have never allowed this fact to influence me Any case showing a temperature of 99° F was isolated [illegible] release the suspect [illegible] experience that [illegible] normal [illegible] Many of [illegible] at all. When the [illegible] in the box [illegible] remained slightly [illegible] and then [illegible] not wise to send [illegible] likely [illegible] of real disease. I [illegible] which the [illegible] the initial rise [illegible] the onset of the [illegible] to have been as long [illegible] apparently [illegible] well. However in [illegible] should [illegible] difficulty in making [illegible] has fallen temporarily, the patient [illegible] coryza may be apparent or a slight [illegible]

As I have said [illegible] isolate entirely the contacts, but if this [illegible] be done the above [illegible] should be carried out, and steps taken [illegible] as far as possible the mixing of these contacts with the main [illegible]

It is especially important that beds and hammocks should be at the [illegible] distance apart. [illegible] that the conclusions arrived at by [illegible] Commander S. F. Dudley regarding the spread of diphtheria and scarlet fever hold good in the [illegible] of measles and other infectious complaints. I have, however, [illegible] evidence that one hour's contact in a room on one occasion was [illegible] to pass on the infection.

It may now be worth while to relate how this procedure has worked out in practice. An *Impregnable* boy returned from Christmas leave and shortly after reported himself as having felt unwell for two days. The rash of measles was just appearing. His division contained forty-five boys, and most of these were [illegible]. They were isolated from the rest of the establishment and the above procedure instituted and carried out. On the eleventh day after exposure another boy was found to have a [illegible] but made no complaint at the time. At the morning muster [illegible] temperature had been normal. He was isolated and the temperature [illegible] raised until the rash appeared two days later. The procedure was [illegible] out for a further fourteen days, but no other cases appeared. I [illegible] it reasonable to suppose that the second case was caught so early that [illegible] little or no time to pass on the infection.

The [illegible] illustration is drawn from the recent epidemic of the [illegible] the Royal Naval College at Dartmouth, but the situation was [illegible] complicated by the fact that the disease was introduced by [illegible] different cadets, each involving roughly a batch of fifty [illegible]

With the first two cases I instituted the above routine and carried

[illegible]

[illegible] the procedure [illegible] all two [illegible] loped the [illegible] being all [illegible] within forty [illegible] of each other and on or about the [illegible] day after exposure. [illegible] five did not subsequently develop the disease. The [illegible] on the list were all [illegible] on in bed for three [illegible] the rash appeared.

[illegible] to the patients [illegible] by these methods an opportunity [illegible] for a very interesting [illegible] and for observing [illegible] the disease which does not [illegible]. Because of the slight rise in temperature the patient [illegible] on the sick list, though he is apparently well or at least [illegible] of illness. It was noticed that as time went on the [illegible] more and more dull and listless and began to lose his appetite. [illegible] the fairly long interval which [illegible] the initial rise and the rise which accompanies the onset of the [illegible]. When fully out temperatures of 104° to 105° F. were common. In [illegible] cases cough was probably the first symptom to appear. [illegible] feature nor were there many cases which had [illegible] catarrh. I noted above that the cough was of pharyngeal [illegible] origin, and quite a number of the cases suffered from [illegible] ranging from a slight huskiness to [illegible]. [illegible] place any reliance on the presence or [illegible] in any case they were not common in this [illegible] that the earliest position for the rash to appear [illegible] palate [illegible] by the forehead and behind the ears. [illegible] recently described in which there has been [illegible] will believe them to be true. I had one case in [illegible] of the disease and the constitutional disturbance was typical [illegible] only appeared on the palate and behind the ears [illegible] transient. My general impression was that the longer [illegible] eruptive stage the more severe is the rash. In a few cases [illegible] began to appear, there was then a period of delay in [illegible] and in these cases when the rash was fully developed it [illegible] intense. On the other hand, one or two cases reported with the rash well [illegible] stays bed for three [illegible] it was probably about [illegible] convalescence usually [illegible] patient leave the hospital [illegible] kept under observation [illegible] to full activities. In [illegible] should be gradual.

[illegible] HAY'S SULPHUR TEST FOR [illegible] IN URINE

[illegible] M.B., M.R.C.P., D.P.H. [illegible]

[illegible] publication by Beddard and Pembrey in the [illegible] 22, 1902 nothing has been written with [illegible] an important clinical test. Those [illegible] value of the reaction. Papers dealing with [illegible] Frenkel and Cluzet [1] and by Chauffard [illegible] ascribed the test to Haycraft, a former [illegible] Birmingham instead of to Matthew Hay, [illegible] Medicine, University of Aberdeen. Some workers [illegible] of the test and have had the temerity to make no [illegible] discoverer in their writings.

[illegible] Hay's work on this subject began in 1882 at the University of [illegible]. He communicated his test verbally to Professor Stirling and [illegible] edition of Landois and Stirling's textbook of Human [illegible] a short note was published to the effect that when [illegible] is sprinkled on a fluid containing bile salts the sulphur [illegible]. He further showed that this reaction depends on the [illegible] and that when one part of pure bile-salt is [illegible] in 120,000 parts of water, the reaction is still given.

[illegible] the first month or two after his useful discovery Matthew Hay [illegible] worked out in detail the quantitative method of its application to urine [illegible] secretions. Extensive investigations were made on the subject of surface ten[illegible] Hay found that sulphur [illegible] readily sink [illegible] all [illegible] fluid with [illegible] with a higher [illegible] although the specific [illegible] higher than that of water Unfortunately Matthew Hay [illegible] proper account of his extensive experiments and his [illegible] escaped general recognition So far no one has discovered an [illegible] clinical test for bile acids in urine. Pettenkofer's test has been [illegible] quantitatively but is not accurate

The sulphur test the technique of which will be described [illegible] later on, consists in sprinkling pure sublimed sulphur on the [illegible] fresh urine. The presence of bile salts lowers the surface tension [illegible] to a fall of the sulphur through the urine

Lyon Caen [3], from a series of careful experiments attaches [illegible] value to the test as a means of demonstrating the presence of bile [illegible] the urine

Brule and Garban [4] studied the Hay reaction from the point [illegible] of its practical value They carried out a series of important exp[illegible] with substances likely to alter surface tension when added to [illegible] very large doses of sandal-wood, copaiba, cubebs and turpentine [illegible] tension was very much lowered and the sulphur fell through the [illegible] with a rapidity and intensity much greater than ever seen in a urine [illegible] bile-salts Those writers proved that chloroform chloral, salicylates [illegible] iodides did not lower the surface tension of urine The presence [illegible] positive Hay's reaction in a urine after chloroform anæsthesia points [illegible] hepatic lesion and not to the presence of chloroform in the urine

Technique —In Hay's original method flowers of sulphur were sprinkled on the surface of the urine in a glass test vessel The writer [illegible] modified technique which requires some care but more exact observation can be made

In carrying out Hay's test certain rules must be carefully observed if reliable results are to be obtained —

(1) The urine must be fresh, filtered if not clear, and allowed to cool down below body temperature as heat has an effect in lowering the surface tension of a fluid

(2) Flowers of sulphur must be thoroughly dry

(3) Sulphur must be sprinkled on the centre of the surface of the urine and must not touch the interior of the test vessel

Modified Technique —The test vessel is a small beaker of thin, good glass $1\frac{1}{2}$ in high and 2 in diameter By adding the urine from a large pipette the inner surface of the beaker is kept dry above the urine level

For convenience and care in technique flowers of sulphur free from grit and thoroughly dry are placed in a metal sprinkler the bottom of which is perforated in its central portion for a diameter of $\frac{1}{4}$ in By means of a revolving spindle and small plate the amount of sulphur sprinkled on the surface of the urine can be controlled

For the best results the bottom of the sprinkler should be ½ in above the surface of the urine in the test vessel By means of a transmitted light the slightest fall of sulphur through the urine can be detected

The sulphur sinks at once when the bile-salts are in a concentration of 1 in 10 000

If the test vessel is very gently shaken and an interval of two minutes allowed to elapse the presence of bile-salts in a dilution of 1 in 10 000 can be detected By waiting for ten minutes the presence of bile-salts in a dilution of 1 in 120 000 can be noted Observation in each test should be carried out for fifteen minutes only

The height from which the sulphur is dropped is an important matter According to McNee the height must be a standard and constant one so that different observations are comparable There is an optimum height for the individual apparatus used and that is found by trial The height must always be the same

McNee and Pritchard (unpublished observations) have found that a pepper pot, held inverted in a clamp at a height of 2 5 cm over the urine, gave the best results with the cell they used

The light should be transmitted from the side of the vessel and the observer's eye protected from the direct rays of light McNee (unpublished observations) uses a square glass cell instead of a round beaker to obviate the deflection of light in both directions as it comes through the vessel

The first specimen of the morning's fresh urine must be used when the bile-salts are small in quantity It is the proportion of bile salts and not the absolute quantity in the urine which affects the surface tension

Fallacies—According to Brulé and Garban errors may arise from the presence of drugs already mentioned, but the intensity of the reaction, the clearness of the urine and the knowledge of the taking of the drugs make confusion of the results impossible According to Beddard and Pembrey, it seems doubtful if such circumstances can occur in sufficient quantity to introduce a fallacy

The quantity of urine passed in twenty four hours should be noted An icteric urine, if very abundant in quantity, might give a negative result because the bile salts are strongly diluted

Summary—Hay's sulphur test has been used by the writer particularly in cases of salvarsan jaundice in catarrhal jaundice, and in cases undergoing treatment by salvarsan compounds

From a study of a series of cases of salvarsan jaundice there appeared to be a much greater disturbance in the elimination of bile salts than of bile pigments According to Brulé [5] slight hepatic disturbances can hinder the elimination of bile pigments more than of bile-salts In salvarsan jaundice a real dissociation namely, a retention of both bile-pigments and salts in the blood but a filtration of salts only through the kidneys occurs very frequently The urine thus contains bile-salts but no bile pigments During the convalescent stage of salvarsan jaundice, a positive Hay's reac [illegible] all traces of bile pigment has [illegible] from the [illegible] about a [illegible] Such findings are in [illegible] jaundice which the condition of "dissociation" was seldom detected. Any dissociation noted was of the type in which bile pigments continued to be present in the urine from which bile-salts had for some time disappeared.

Our knowledge of the metabolism of bile pigments and bile salts is still incomplete. It is probable that the "dissociation" in which bile salts alone continue to appear in the urine points to a definite hepatic lesion. Bile retention is indicative but not a measure of the degree of hepatic insufficiency. It is not an indication of derangement of the other functions of the liver.

Conclusions

(1) Hay's sulphur test is very simple and is of much clinical importance in investigating the relative excretion of bile salts and bile pigments. It is of particular interest in the study of salvarsan and "dissociated" jaundice.

(2) The modified technique should be used.

(3) The reaction of the urine and its specific gravity do not in any way affect the accuracy or delicacy of the test.

(4) Compared with Pettenkofer's test the delicacy of Hay's reaction is marked. The many fallacies in applying Pettenkofer's test render it almost useless. 1 part of bile salts in 1 000 gives only a doubtful reaction.

(5) The causes of error in interpreting Hay's test are easy to avoid.

(6) The test reveals the presence of bile-salts in slight liver lesions hitherto unobserved.

(7) A haphazard technique in the use of Hay's sulphur test will lead to entire failure to recognize cases in which bile salts are present in the urine in small amount.

Grateful thanks are due to T. W. McNee, M.D., F.R.C.P., Deputy Director, Medical Unit, University College Hospital, with whom the writer commenced the study of salvarsan jaundice, for permission to refer to unpublished observations.

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CLIMATIC BUBO

By Fleet Surgeon W I HOME ... M D ... M ... R N
(Retired)

An article in the *Lancet* of February 13 1926 on climatic bubo has made me think of the cases one has seen and as these cases appear to be still frequent in the East perhaps these older experiences may interest those of the present day

The *Lancet* reported papers one by a German Dr Gunther of Hamburg the others by an Italian Dr Virgillo Italian Navy each author thought this bubo to be venereal but neither could prove that Both agreed that suppuration was focal not massive The Italian had succeeded in infecting a guinea pig and reproducing the inguinal bubo but neither could yet state the cause of the disease Lieut (Junior Grade) J M Barnes Medical Corps, U S N , writing in the U S *Naval Medical Bulletin* for January 1926 agrees pretty well with these other writers discouraging the old treatment by incision and drainage, preferring puncture or aspiration if pus does form but relying rather on hot water bottles calomel, potassium iodide and foreign protein (in fact typho bacterin) 1 or 2 c c every five or six days, intramuscularly and he expects the buboes to be well in a fortnight if they do not suppurate, in four weeks if they do unless they require incision and drainage when they may last for months

Bubo was formerly far more prevalent than at present in the Naval Service and had some reaction on administration We know from Deputy Surgeon-General W Tait's well-known History of Haslar Hospital, p 109 that in 1854 female nurses were replaced generally at Haslar by men, and Sir John Watt Reid Director General when I joined told me that was in part because Their Lordships were pained at one of their inspections of the Hospital by finding the women poulticing these buboes The fact that treatment was going on during an inspection suggests that there were many cases to treat The number of cases has decreased in recent years but appears to be still high in the East

In my own recollection there were many cases in Chatham Hospital in 1892, and they were poulticed (linseed) till they "resolved" or suppurated when they were opened and, perhaps after extensive burrowings of pus and repeated further "openings up," they ultimately closed Patients were sometimes months in hospital

In November 1893, I joined the sloop *Swallow* (150 men) at Zanzibar and found two cases of bubo on the list one ascribed to abscess of the heel one to strain , five other cases, sequels of venereal disease, appeared later Each was off duty for fifty to a hundred days, so the loss of service was serious I relieved Surgeon E St M Nepean, who had come up in *Swallow* from a Zambezi gunboat, and had been only a month at Zanzibar, [illegible] [illegible] how many [illegible] [illegible] half a mile outside the town and had [illegible] to drive them away. [illegible] were thus returned to the town, in [illegible] they had a better chance to keep them [illegible] clean and the [illegible]—three years at Zanzibar—had but two buboes, one a relapse [illegible] thought to be from strain in a weakly man following a long [illegible]. The difference as regards bubo cases was very striking and [illegible] it to Surgeon Nepean's thoughtful preventive advice. The [illegible] in charge of the hospital at [illegible]

[illegible] Glandular Diseases 1862-1922

	Station	[illegible]	[illegible]	[illegible]	Lymphatic and glandular system 1898	1902	1912	Lymphatic system 1922 Navy	Army	Lymphatic system and ductless glands R A F
Cases per 1 000 men	Home	[illegible]	[illegible]	[illegible]	9	8	4	1	[illegible]	[illegible]
	Mediterranean	11	16	11	[illegible]	6	2		[illegible]	—
	China	30	18	[illegible]	25	8	10	16	[illegible]	—
	East Indies		13	[illegible]	[illegible]	20	10	23	[illegible]	—
	Total Force	[illegible]	[illegible]	[illegible]	[illegible]	8	[illegible]	3	[illegible]	[illegible]
Total days lost in Total Force		20,83[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15,087	8,6[illegible]	17,08[illegible]	[illegible]
Days duration of each case		[illegible]	[illegible]	[illegible]	31	[illegible]	33	32	27	[illegible]

in January 1893 told me he saw many of these buboes and [illegible] also thought them due to mixed infections, dirt and venereal disease. He opened them by puncture, and recent writers support him.

In Hong Kong, in 1893 and 1894 buboes were very frequent. Most of them were acknowledged to be venereal, and irregular intercourse had nearly always been so admitted preliminary to the others—just what Dr Gunther had found at Hamburg. The best treatment at Hong Kong seemed to be early removal before periadenitis had matted the tissues together. Two cases may be mentioned. They fell ill almost the same day. One had the glands removed in *Tamar* that afternoon and was fit in a month to be sent home with a small healing wound; the other was still [illegible] temperature in hospital [illegible] not yet thought ready for [illegible]. Of many, one only healed by first intention, the others all suppurated but were got back to duty in 1878 after eight weeks, in 1899 after six. In those days iodine was not used to sterilize the skin.

The table shows how many cases were recorded per thousand on the Home, Mediterranean, China and East Indies Stations and in the total force at intervals of ten years since 1862 and the average duration of each case, with the various names under which the disease has been classified, bubo being about 90 per cent. of the group. Also the table shows the total days lost to the Service by this disease from period to period. The parallel figures from the Army and Air Force for 1922 are shown so far as available. It will be observed that the Army, like the Navy, experiences more of these cases in India and China. The number has greatly decreased lately, but the duration of each case has remained curiously uniform for many years. So perhaps attention to these cases would be repaid. Their [illegible] nature remains unknown. The term "sympathetic" applied to them [illegible] nothing and "climatic" means little more. The disease is generally thought to be venereal even by patients while strenuously contesting the assignment. Syphilis does not usually cause a suppurating or even a painful bubo, and no case is reported with a positive Wassermann. A surgeon and agent I knew used to declare that all buboes that "went back" were syphilitic, but that has not been my experience. The bubo of gonorrhoea is very rare, very acute when it does occur, and less chronic. Dr. Virgillo says the soft chancre bubo shows Ducrey's bacillus in the pus and does not cause swelling of the "iliac" glands. I do not know about these or the "pelvic" glands mentioned by Dr. Günther. Several questions may be asked. Are these buboes associated with neglected prophylaxis? On the other side, what particular strain is it that is most often associated with them? Dr. Günther speaks of an incubation of three to eight weeks. Is that usual? Are such cases more common in any special class of ship? Or in any particular group of the ships' companies? Perhaps detailed clinical accounts of cases, with reports by pathologists on [illegible] removed early, might help, particularly if they came from the tropical stations where these cases are most prevalent, with information whether they also occurred in the local hospitals in Europeans, in natives [illegible] women. They were more common in men under 25 (1872, 12; 1882, 14; 1892, 16; 1902, 9 per 1,000 in the Navy). It is certainly curious that no definite blood picture is associated with this disease, suggesting that the causes are various; but this could only be confidently accepted when a hundred carefully made blood counts had been made and examined. The disease presents many problems for solution.

THREE GREEK EASTERS

By Surgeon Commander L. F. COPE, O.B.E., R.N.

Of all the religious observances of the Greek Church, those connected with Easter are not only the most important but also the most picturesque. Starting with a procession on Good Friday evening, in which an empty coffin is carried round the parish, to the unaccompanied singing of Byzantine dirges and afterwards deposited in the church, thus typifying the burial of Christ, and continuing through the Saturday, when crowds throng the churches all day to pray at the bier of Christ, the ceremonies culminate in the solemn night Mass, followed by the announcement at midnight that "Christ is risen" by the highest dignitary of the parish church. This last ceremony is strikingly impressive, wherever one takes part in it, but especially so in Athens and Constantinople. It is doubtful, however, if, in the whole course of the history of the Greek Church, there have been any of these Easter celebrations more interesting from a national and political point of view than those of the years 1920, 1921 and 1922.

Let us attend these three celebrations, visiting Athens for that of 1920. Alexander, the second son of the exiled King Constantine, was king, having been placed on the throne by the Allies during the Great War, when doubts as to Constantine's *bona fides* to the Allied cause made his continued tenure of the Greek throne a menace to the cause of civilization. With Venizelos as the Premier, Greece was riding on the crest of post-war prosperity. Greek money was very little below par, the Allies were friendly, and the Greek dream of an Anatolian Empire seemed on the road to realization. Greek troops were occupying the Smyrna zone, and in spite of some discontent due to the lengthy period the manhood of the country had been kept under arms (ever since the Balkan Wars of 1912 and 1913) the country was, on the whole, contented.

The square opposite the cathedral at Athens was thronged with the usual crowd on Easter Eve. Opposite the main entrance a small dais had been erected in accordance with custom, for the various specially invited personages. This was fairly well filled when the usual service in the cathedral began at 11.30 p.m., and the arrival of M. Venizelos, shortly before midnight, evoked rounds of applause, a demonstration to his popularity repeated a few minutes later when King Alexander—youthful, broad-shouldered and *debonnaire*—drove up unescorted in his car. At midnight the bells of the cathedral rang out their message, the doors were opened, and in the stream of light across the darkened square appeared the venerable figure of Meletios, Metropolitan of Athens, in his robes and mitre blazing with jewels. He walked slowly across to the dais, accompanied by [illegible] lighted c[illegible]. Mounting the dais he [illegible] gave the K[illegible] ceremonial kiss and greeting of [illegible] Christ is risen [illegible] the King gave the traditional [illegible]. He [illegible] and then lit a taper at the [illegible] in the cathedral, the doors of [illegible].

[illegible] and from the dais the [illegible] to the w[illegible] crowd in the square, so that gradually [illegible] space became [illegible] with twinkling lights, as each member [illegible] lit the taper he had brought, specially for that purpose [illegible]. The King drove back to the palace still [illegible] while the crowd slowly wended its way home, shielding the [illegible] blown out for the taper must burn itself out at [illegible] of good luck.

[illegible] finds us once more at Athens. Again the cathedral [illegible] with the crowd—the same crowd but with a difference [illegible] was a homely affair, for the young King, since dead, [illegible] unostentatious. The King *de facto* Constantine, who had [illegible] previous December as the result of the elections that drove [illegible] a friendless fugitive out of Greece, was quite the reverse. [illegible] the crowds everywhere, and even the housetops round [illegible] guarded by infantry. The personages on the dais were [illegible] the Prime Minister, Gounaris who had shared the King's exile, [illegible] that had been accorded to Venizelos the year before. The King [illegible] late, an unusual occurrence, in a horse drawn carriage escorted by cavalry, two of whom arrived on foot later still having been unhorsed during the progress of the procession from the palace. The greeting the King received was enthusiastic beyond description.

It was a different Metropolitan who gave the greeting, his predecessor Meletios being in exile owing to his Venizelist views. The present Metropolitan Theokletos had come into his own again having been removed from his office and kept a prisoner in a monastery in the Peloponnesus during the Venizelist *regime*, but had now on the return of Constantine been restored to his office and dignities. Once again the square lit up with twinkling lights. The King, still escorted by cavalry, returned to the palace, cheered to the echo, and the patient crowd, pushed here and there by departing companies of soldiers, tried, and in many cases in vain, to carry home their tapers alight, while a fitful gusty wind whisked round street corners and tapers blew out to the delight of the Venizelists who predicted the speedy downfall of the Royalist *regime*.

Easter Eve 1922 finds us in Constantinople at the Church at Phanar of the Œcumenical Patriarch, the highest dignitary of the Orthodox Greek Church, who is none other than our old acquaintance Meletios, erstwhile Venizelist Metropolitan of Athens.

The Patriarch's palace at Phanar on the Golden Horn is the head

... on but ... a small old Byzantine building has little to recommend it ... and historical associations. Meletios had become Patriarch having spent part of his exile in America and England by the vote of the bigger half of the Synod who were like himself Venizelists and in spite of the protests of the remaining Bishops Royalists backed by the fulminations of Constantine himself.

The Greek Anatolian Empire was tottering to its fall. Kemal was beginning to be a power in Anatolia and the position of the Patriarch in Constantinople was daily becoming less secure but the usual ceremony took place on Easter Eve with a splendour that hinted at none of these things. Besides the Patriarch seven Bishops all exiles from Greece and proscribed by the Royalist Party took part in the service in their robes and mitres, and each one carrying his pastoral staff. The church was packed to the doors with a motley crowd of Greeks many of whom had arrived wearing the fez while the doors were guarded by the Patriarch's police whose uniforms were exactly those of their Athenian brothers.

Inside, all was light gorgeous vestments shining jewels and the sonorous singing of age old Byzantine chants. Outside the forecourt of the church was empty and the wooden buildings huddled along the shores of the Golden Horn—dark, mysterious and silent—seemed to threaten dire misfortune to these ministers of an alien religion.

As the service ended long before dawn, from the minaret of a mosque above the Patriarchate, the voice of a muezzin broke the silence—the challenge of the younger religion to the older.

* * * *

What has happened to the protagonists of these three great festivals?

Alexander is dead the victim of a bite from a monkey while saving his favourite dog.

Venizelos a voluntary exile from Greece enjoys the *otium cum dignitate* which is surely his due after many years spent in his country's service.

Constantine driven out of Greece by his people when their eyes were opened to the hideous mismanagement of the war in Anatolia is dead also.

Gounaris his Premier was shot by sentence of Court Martial for his part in the Anatolian affair.

Meletios the Patriarch deported from Constantinople by the Turks who feared his political influence is a monk in a monastery on the Mount Athos Peninsula.

* *

Personalities come and go but the great Easter ceremony endures repeating year by year, its message of hope and better things to come—a message that will endure when the memories of political plots and counter plots have faded away, together with the names of those who hatched them.

[illegible] DAY'S OUTING FROM AMBOINA CERAM ISLAND DUTCH EAST INDIES

By [illegible] Lieutenant W. J. Bankine, R.N.

[illegible] at Amboina we found that the Government officials had [illegible] Ceram village of Waai to say we would like to pay a visit, and [illegible] would be of very great interest. The following [illegible] perfectly unique day, even for Dutch officials of many years experience.

The party of twenty seven set forth in eight motor cars—the very first in Amboina—and, driving along the shore of the inner bay passed through several native villages dotted here and there amongst the usual tropical vegetation. In parts the road was good, in others bad but, as it had only just been built through swamps and jungle and over innumerable water courses, the real wonder is that there was a road at all. Some of the views from the hill tops were magnificent, looking down on the various kinds of palms, occasional coconut groves and banana plantations to the sea. This part of the road was just a track of grass cleared and improved where absolutely essential, with many fierce and bumpy gradients which proved rather too much for the most ancient car of the party, however, with the aid of willing though perspiring hands, she puffed successfully to the top of them all.

A rapid descent brought us to the end of the first part of our journey at the shore side village of Tolehe. Here the whole population of the village had gathered in the vicinity of the Rajah's house—palace I mean. In front properly drawn up as on parade, were the school children all dressed in their best and brightest *sarangs* (native skirts) and *bajus* (linen coats), each with a yellow paper sash round them and a small Dutch flag in their hands. Judge our utter amazement when these merry little infants raised their melodious voices and sang "God Save the King" followed by the Nederlands National Anthem!

We were introduced to the local ruler the Rajah Tuan, who was dressed in uniform and wore a Dutch decoration. Two little ladies now appeared and walked around quietly shaking hands with us. They were his wives for other ladies appeared later.

The next item was to be photographed and the photographer himself provided the comic relief for he would persist in knocking off the cap of the lens with his hand after each "Smile, please."

A move was then made to the beach where about seven yards out lay the decorated canoes which were to take us across the bay to the village of Waai. Instead of doing so ordinary a thing as wading we were carried out to them in chairs. The canoes were cleverly decorated with the bark and leaves of trees which hung all round them like a very open bamboo screen. Amidships over the platform hung a beautiful canopy of counterpanes, whilst at both ends were hoisted Dutch flags. The equipment was completed by seven paddlers on either side, a *serang* (coxswain) and a musical party with native drums, gongs and a bamboo flute. After a triumphal sweep round for the sake of the villagers we set forth across the bay amidst the most awful din from the drums and gongs which was continued the whole way. The journey took not less than half an hour.

The beach at Waai was one mass of brilliantly clothed natives who had come to greet us, but in one place was a space occupied only by the chiefs and behind them a regular gala archway inscribed "Welkom."

On landing we were received by the Dutch district officer and various chiefs. At the conclusion of the introductions we advanced towards the triumphal arch, but on arrival at it found, drawn up within, the Waai bamboo band, which at once kicked off with the British National Anthem with variations, and this was rapidly followed by the Dutch Anthem. This band now led us to the local school-house which had been turned into a club for the occasion, and where very welcome refreshments were provided—to the accompaniment of the band's best efforts at "We have no bananas to-day." This shock made further refreshment essential.

The band was then somewhat inconsiderately broken in upon by the melodramatic entry of the native war dancers. They were dressed in head-dresses of foliage, and the upper parts of their bodies were ornamented with beads and bracelets, which made a great contrast to the black and glistening skins. For arms they carried swords and spears, also a very narrow shield made of wood and studded with shells. These warriors had their own band consisting of quaint bamboo instruments. After a long and weary imitation battle they all sat around to sing the execution song, the chief sang a somewhat mournful dirge, the warriors chipping in with suitable responses at intervals.

This was followed by quite a different kind of thing, namely, the "Fish Tableau." A few small boys entered the arena disguised as fish by donning a headpiece of bamboo representing a porpoise, another in sacking representing a shark, others squatted down on their hunkers and then hopped about like frogs. Then entered a fishing craft made of bamboo and leaves and manned by a cheery crew of little boys who entered fully into the spirit of the show and pranced their craft backwards and forwards in the liveliest imitation of a windy day at sea. One by one the porpoises succumbed to the fishermen's bait, and taking it through their masks made great play of fighting whilst the line was hauled in and paid out in the best "Tay" style.

Hardly had this very delightful display ended when the band struck up a kind of two-step, and on turning round, we found that the verandah had been invaded by the female youth and beauty of the village who were sedately dancing a preliminary measure while inviting partners to join [illegible] and joined up [illegible] ladies in the [illegible] safety even in a [illegible] behind [illegible] wall flower [illegible] round and carefully placed [illegible] vacant knee [illegible] surely have improved on the [illegible] of those thus [illegible]

[illegible] made and we all formed up hand in front each [illegible] a girl on either arm to walk round the town singing [illegible] Having thoroughly toured the village we were eventually led along [illegible] charming glade in which flowed a clear shallow stream. At the entrance we temporarily discarded our little lady friends, and soon did ditto with our clothes to enjoy a really cool though shallow bathe, meanwhile spreading our garments in the sun so that they were reasonably dry when we came out to replace them.

We returned to the club only to find it strongly held by the chaperons, who were very determined to dance, a dance in which it is the height of politeness to salute your partner upon the cheek at no infrequent intervals. But youth would not be denied and very soon all were again dancing the same two steps and a quadrille. The latter dance created a certain amount of rather unworthy suspicion, for one of its features was a march round the garden and some of the couples got temporarily lost.

Alas! Time and tide wait not for the white man, so we departed as we came [illegible] where we were again received by the majority of the [illegible] and led to the Rajah's house whilst the cars were being got ready for our return to Amboina.

It only remains to record that on the way back we stopped at the temporary prison quarters of a gang of murderers who were being employed on the road. They very civilly raced up some nearby coconut trees to get some for us and then proceeded to open them with their *parangs* (heavy kind of hunting knife) and handed them round for us to drink the milk.

Thus ended an amazing and unique day—a wonderful welcome in a very out of the way place. Get a map and see if you can find Amboina without using the index—let alone Toleho or Waai.

Naval Medical History of the War.

HISTORY OF THE MEDICAL UNIT OF THE ROYAL NAVAL DIVISION FROM ITS INCEPTION TO THE EVACUATION OF GALLIPOLI

[illegible] ARTHUR GASKELL C.B. [illegible] F.R.C.S. [illegible]

Late A.D.M.S. of the Royal Naval Division.

(*Continued from p. 110.*)

At [illegible] on Monday July 12, a very hot bright sunny day, the [illegible] being preceded by a tremendous artillery bombardment [illegible] and a half. Before the attack, the 52nd Lowland [illegible] positively fresh, received orders to take over the 1000 [illegible] held by the Royal Naval Division, the French being on the [illegible] 42nd (East Lancashire) Division on the left. The Naval Division [illegible] support the 52nd and this the medical unit interpreted as [illegible] of the evacuation of the wounded. The 52nd Division advanced [illegible] took the first line of enemy trenches and then a strange [illegible]. More and more Lowland troops hurried forward packing the trenches so densely that no one could move or bring up supplies. With the trenches in that state the Royal Naval Division suddenly received orders to advance beyond the ground taken by the Lowlands. The *Portsmouth* and *Nelson* Battalions forced their way through, but the *Chatham* could not get through the terrible block. This left the *Portsmouth* unsupported on their right wing and exposed them to very heavy losses. But in spite of all this the Royal Naval Division made a magnificent advance, took all the trenches required, and for the next week consolidated the position. This engagement, the most bloody of all, proved the decisive point in the history of the Gallipoli campaign. Thenceforward it became evident that without more troops no further hope existed of fighting our way through to Constantinople. The medical arrangements in this engagement are summed up in the following reports from the A.D.M.S. and the C.Os. of the 1st and 2nd Field Ambulances.

Copy.

Divisional Headquarters,
Royal Naval Division,
24th July 1915.

Confidential.

MEDICAL REPORT ON ACTION OF 12TH JULY AND SUBSEQUENT DAYS.

Part I.

By order from the VIIIth Army Corps I was entrusted with the duties of Corps D.D.M.S. during Col. Yarr's absence through sickness.

Although the actual attack was to be made by the 52nd Division (subsequently it occurred that after the first attack was delivered by the 52nd Division the further advance was made by the R N D ; it was considered advisable that the R N D Medical Unit should take over all the medical arrangements as they knew the ground better and were in every way better prepared than the Medical unit of the 52nd Division I arranged however that their First Field Ambulance bearers should supplement our 1st Field Ambulance and their 3rd our 2nd I also later made some use of two sections of Bearers from the 42nd Division

The general scheme of evacuation was divided into two stages or areas

Stage "A" consisted in bringing the wounded from the Regimental Aid Posts to "Sandbag Corner" near Brown House

Stage "B" included the carrying the wounded down the nullah from Sandbag Corner to the wagons at the Advanced Dressing Station at the rear of Hill 200

A cursory glance at the trenches would at once make anyone realise that the evacuation of wounded even with all the ways clear would be an extremely difficult feat

Now in these actions of 12th July onwards the number of troops thrown into the Sector amounted to something like 12 men to the yard of front ! yet in about two days our men evacuated 2,100 wounded

No words of praise from me can do justice to this perfectly marvellous feat and it is commented upon on all sides

The vast majority of this work was done by the R.N D and of the two stages of evacuation I consider the more difficult part was that which was carried out by our 1st Field Ambulance I should wish to especially mention Staff Surgeon Fleming's name in connection with this His subordinate officer, Surgeon Pratt, also proved himself to be a fearless and level headed officer

After my report of the Anzac fighting was sent in I have heard of some extremely good work done there by Surgeon Pratt and modestly left unmentioned I should like to take this opportunity of strongly recommending his name for recognition As regards the others it is difficult to pick out names without doing an injustice to others where all worked magnificently and cheerfully in spite of great fatigue and continual danger from artillery and rifle fire.

Arthur Gaskell
Fleet Surgeon R N &
A D M S of R N Division

Copy

To A D M S
R N Division

From
O C 1st Field Ambulance
R N Division

Sir,

I beg to submit the following report on the action of July 12th 13th 14th and 15th

On Saturday July 10th "C" Bearer Sub Division under Surgeon Calthrop moved up to Brown House He had orders to make himself acquainted with all the R A P s and communication trenches for evacuation of wounded His N C O s and men had similar orders

At 4 15 a.m on 12th July "A" & "B" Bearers were moved up to Brown House "A" bearers under the command of Surgeon Adams and "B" bearers under the command of Surgeon Pratt, the latter being Senior Bearer Officer of the Bearer Division "A" bearers had orders to work the left Sector (Plymouth Road) from R A P to Sandbag Nullah 'B' and "C" were to work the centre and right sectors and evacuate wounded from R A P s of this area to Sandbag Nullah

A bearer post was established in this area (Central Road) about midway between the R A P s and Sandbag Nullah This was done to avoid congestion at Brown House and Sandbag Nullah and to afford protection from fire for bearers

During the action the bearers of the First Field [illegible] R.N.D. were assisted by two Bearer Sub Divisions of the First Lowl[illegible] of the 52nd Division The O C (Col Liddington R A M S [illegible]) and his two Bearer Officers, Lt. Dowes and Lt Sutherland gave every possible assistance and the bearers of this ambulance worked very hard throughout

The prolonged period of this action has been a great test of the endurance of the bearers both Officers and men, and it is to their credit that they worked throughout cheerfully and well

I wish to bring to your notice the admirable manner in which Surgeon Pratt acting as senior bearer officer regulated the evacuation of the wounded This Officer was indefatigable in his work which entailed a severe test of endurance and he displayed great common sense and power of organisation in the very difficult task he had to perform

The bearers of this field ambulance deserve great credit for the way they worked, as they had to bring the wounded down from the R A P s to Sandbag Nullah a distance of about one and a half miles This task was a very difficult one owing to congestion of troops in the trenches and the traverses over which they had to lift the stretchers They evacuated about 1 500 wounded

S 5107 Sergeant Carr s name has been brought forward to me by Surgeon Calthrop who states that this N C O worked very well and organised the working of "C" bearers in a creditable manner I beg to submit his name for promotion to Staff Sergeant as I think he is a very good N C O and performs all his duties smartly and well

Where all the bearers N C O s and men worked consistently well, it is difficult to pick out any individual act, deserving of special notice

Boracic powder and antiseptic paste were used on all wounds except abdominal and the fact noted on identification label, 166

I attach suggestions, which were brought to my notice by the bearer medical officers and which I submit for your consideration

In conclusion I was much impressed with the necessity of the bearer medical officers knowing beforehand the ground for the evacuation of the wounded, and their constant supervision of the bearers so as to regulate the flow and arrange for rest and food

(Signed) A I Fleming,
Staff Surgeon R N
O C 1st Field Ambulance,
R N Division

July 18th 1915

Copy

Imbros,
July 18 1915

To A D M S
Divisional Headquarters
R N Division

Sir,

I have the honour to submit the following report on the action 12th and 13th July in so far as it bears on the work done by the Field Ambulance under my command

1. The following was the arrangement for the transport of the wounded

"C" sub division bearers under Surgeon Sparrow were posted at the East Lancashire Field Ambulance Station in the nullah They were receiving cases from the First Field Ambulance bearers at the head of the nullah carrying them down to Backhouse Post and calling in at the East Lancashire Dressing Station for dressing when necessary From Backhouse Post to Skew Bridge the bearing was done by the Lowland Division Bearers and from Skew Bridge cases were taken over by the Bearers of "A" and "B" sub divisions under Surgeons Meyne and Foxell also were stationed at 300 Hill. The cases were then transported by wagons to the main dressing station, where they were seen and finally passed to the Casualty Clearing Station by motor ambulances. This arrangement worked rapidly and smoothly, there being practically no blocking of transport on route.

2. With regard to the work of my field ambulance as a whole, without exception I cannot speak too highly of the work done by Officers, N.C.O.'s and men. In this connection I should like to bring to your notice the courtesy and helpfulness of the Officers, N.C.O.'s and men of the East Lancs and Lowland Divisional Field Ambulances, and particularly I should like to mention Lt. Radio as one most helpful.

3. With regard to individual Officers I have specially mentioned on the official form attached the work done by Surgeons Burdett and Sewell. I should also like to draw your attention to the work of Surgeon Allen who has performed his duties throughout the campaign with the utmost zeal and ability.

4. I attach the reports handed to me by my section Officers for your consideration. I have mentioned on the attached official form those men who in my opinion deserve official recognition for their services.

[illegible] I wish to record the extremely arduous and exacting work which fell to the lot of the clerical staff under Sergt. Childs. The work done by No. S.3250 [illegible] of the utmost importance and having been so thoroughly [illegible] I submit that his services are worthy of official recognition.

In conclusion I should like to draw your attention to the number of cases which have passed through my field ambulance, thus indicating the arduous task which they have performed. There was also continual danger from shell fire which was probably intended for the surrounding batteries.

I have the honour to be,
Sir,
Your obedient servant,
(Sgd) C. E. Cortis Stanford
Staff Surgeon R.N.

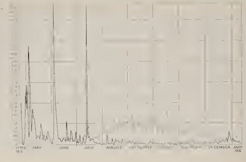
The engagement of July 13, after which no severe fighting occurred, marks the point when, as the accompanying chart clearly shows, the numbers of killed and wounded began to decrease. It marks also the point when the casualties from disease began to soar rapidly. So serious became this increase of sickness that the A.D.M.S. wrote the following letter to the G.O.C. —

Divisional Headquarters,
Royal Naval Division,
23rd July 1915.

Sir,

I have the honour to submit that it is my duty as A.D.M.S. of your Division to bring to your notice the increasing physical and mental exhaustion of the officers and men of the R.N.D.

From close observation of the sick lists and from conversation with and reports from the C.O.'s of the three field ambulances and the M.O.'s and the C.O.'s of the regimental units, I am convinced that the health of the Division as a whole is in a low state. Their resisting power has been slowly diminished by digestive troubles and very arduous and fatiguing work in hot sun and to foul smells from decomposing corpses. I consider that the condition of the men at present is reduced to one third or at most one half of that which they enjoyed two months ago, and that from a military point of view there would be a grave danger in merely counting heads without taking into consideration the condition of the men.


APRIL
MAY
JUNE
JULY
AUGUST
DECEMBER
JANY
1946

For the last [illegible] months our M.O. [illegible] been sedulously [illegible] any [illegible] to prevent men being allowed to [illegible] to go sick but the state of affairs [illegible] go on [illegible] and the la[illegible] of admissions to hospital during [illegible] fortnight testifies to the fa[illegible] that the time has come when the whole [illegible] should be given a complete [illegible] of [illegible]

I have the honour to be
Sir,
Your obedient Servant,
[illegible]
[illegible] Surgeon [illegible] and A.D.M.S.
of R.N. Division.

[illegible]
Royal Naval Division.

[illegible] signs of [illegible] of [illegible] Expeditionary Force. Doubtful [illegible] in which rifles blew [illegible] trigger fingers, dentures [illegible] through [illegible] accidentally trodden on [illegible] down as a routine that [illegible] of the Peninsula.

[illegible] Naval Division took [illegible] little part in any fighting after [illegible] full.

[illegible] importance. The [illegible] problems of every war—received [illegible] unit is so intimately [illegible] the reader to find allusions [illegible] Another sanitary problem—[illegible] became more easily [illegible] installation [illegible] Thresh disinfector [illegible] dressing [illegible] medical unit [illegible] attending [illegible] sanitation also took the [illegible] full in fighting to overhaul all its stores.

[illegible] the 2nd Field Ambulance went to the Rest Camp at [illegible] Field Ambulance returning to the Peninsula.

[illegible] reinforcements—one officer and ninety-nine men—[illegible] our field ambulances nearly to their full strength. [illegible] camps and trenches continued and on July 29 [illegible] had his left leg badly shattered by a shell, receiving [illegible] wounds in other parts of his body. He eventually [illegible] of the limb. With [illegible] departure we lost [illegible] officer.

On August [illegible] sector of the firing line to the French [illegible] 42nd [illegible] Divisions. The French took over [illegible] advanced bearer [illegible] the 42nd Division [illegible] advanced dressing station [illegible] Hill 130. We [illegible] our other dressing stations and bearer posts [illegible] we helped the 42nd Division in their actions of August 7, 8 and 9, actions which formed a part of the general scheme of the Suvla landing.

This Suvla undertaking, looked forward to with such sanguine hopes of [illegible] landing the long vigil at [illegible] [illegible] in Masefield's "Gallipoli." After reading [illegible] of disappointment that it failed when it was so nearly [illegible]. Yet although the Suvla landing ended in failure the provision [illegible] hospital ships for the evacuation of the wounded was good. In combined [illegible] and military operations on active service the anxiety of the medical [illegible] can be enormously lightened if there exists a good organization [illegible] the [illegible] evacuation of the sick and wounded. In the early [illegible] Gallipoli the shortage of hospital transport caused much anxiety. With the arrival however of Sir James Porter a great change occurred. With his characteristic energy and persistence he soon brought into being [illegible] an efficient reorganization of the medical transport by sea that [illegible] smoothly from its first severe test at Suvla and Anzac on August 6.

The Naval Division medical unit took part in the landing. Orders arrived from G.H.Q. that we were to detail one field ambulance for service [illegible] Imbros, and as Stanford's field ambulance was already there the following letter was sent him by the A.D.M.S.:—

Copy No. 1

Divisional Headquarters,
Royal Naval Division,
4th August 1915.

Dear Stanford,

I have received orders from G.H.Q. to detail one field ambulance for immediate service at Imbros and to send over its equipment to the [illegible] [illegible] permanent of the Tent Subdivision. All this sounds a bit complicated [illegible] I have replied that I would suggest sending your field ambulance as you [illegible] the spot, and that I would send over [illegible] equipment. By the way, the [illegible] of this equipment has been left to my discretion, which is a little embarrassing, as I do not know yet what you will be called upon to perform.

I signalled that I would send one officer and six men, but since talking the matter over [illegible] I shall send you the whole of your [illegible] which is about thirty [illegible] men and Surgeon Bostock will take charge [illegible] [illegible] your stores for the passage over. He will then return alone.

I enclose you a copy of the list of stores which I propose to send [illegible] and as soon as I know the [illegible] and the hour on which the boat will be coming over I will wire you at once, so that you can send down all your bearers to help to bring the stores up [illegible] no vehicles are allowed.

I want you to go over to see Surgeon General Birrell, the D.M.S. at G.H.Q. at once and tell him that I have told you to report yourself to him [illegible] find out what duties you will have to perform and whether you will [illegible] to the R.N.D. Then wire or write [illegible] if there are any other of your stores [illegible] which you would like sending over.

It looks as though you were in for some interesting experiences [illegible] I envy you.

Yours very sincerely,
(Signed) Arthur Gaskell,
Fleet Surgeon R.N. & A.D.M.S. [illegible] R.N. Division.

Staff Surgeon Stanford, R.N.
O.C. 2nd Field Ambulance, R.N.D.

List of [illegible] Field Ambulance

Medical [illegible]	[illegible]
Surgical [illegible]	[illegible]
Field [illegible]	[illegible]
Reserve [illegible]	[illegible]
Field [illegible]	[illegible]
Field [illegible]	[illegible]
Reserve [illegible]	[illegible]
Stretchers	[illegible]
Neil Robertson [illegible]	[illegible]
Medical [illegible]	[illegible]
G S [illegible]	[illegible]
Antiseptic [illegible]	[illegible]
First aid [illegible]	[illegible]
First aid [illegible]	[illegible]
[illegible]	[illegible]
Blankets	[illegible]
Ground sheets	36
Red Cross flag	1
Filter	1
M O refill box	1

On August 5 Stanford [illegible] Powell who referred [illegible] to Major Sparkes [illegible] A D M S [illegible] 11th Division.

[illegible] Major Sparkes he learnt that [illegible] ambulance would be [illegible] the 11th Division at the [illegible] place of the 34th Field Ambulance R A M C which had [illegible]

On August 6 he received information that [illegible] field ambulance would [illegible] the tent subdivisions [illegible] "C" beach the bearer [illegible] at "B" beach. He therefore [illegible] Surgeon Foxell to com[illegible] subdivisions, while he [illegible] accordance with orders [illegible] tent subdivisions by motor lighter [illegible] H M S *Endymion* arriving [illegible] at 3 30 p m. The *Endymion* left [illegible] p m arriving in [illegible] other ships off "C" beach at [illegible]

On August 7 at 1 30 a m, he left *Endymion* and [illegible] lighter conveyed him [illegible] The stores having been [illegible] had to be replaced [illegible] and they proceeded to "C" beach finally landing at 2 30 a m [illegible] he found a small hill which [illegible] his men from [illegible]

The [illegible] subdivisions under Foxell embarked in H M S *Theseus* in [illegible] August 6 and disembarked at [illegible] on [illegible] The M L O on "B" beach knew nothing of any medical [illegible] that beach. Foxell however [illegible] as rapidly and as well as possible and to spread themselves well out. They only had a few wounded to deal with so the majority of the men rested during the remainder of that night. During the forenoon of August 7 Stanford [illegible] his men and stores to Foxell's [illegible] "B" beach [illegible] the [illegible] Brigade to which he had been ordered to attach [illegible] this [illegible] Stanford found the country in this [illegible]

[illegible]ly flat and [illegible]. He [illegible] at a spot app[illegible]. He [illegible] with O.C. [illegible] Stanford [illegible] transport. His [illegible]

Stanford then took command of the whole field ambulance and ran it as a complete unit for the remainder of the time he spent at Suvla. His bearer officers established a junction with the medical officers of the South Staffords, Sherwood Foresters, Borderers and Lincolns, the four battalions of the 33rd Brigade. Only the South Staffords at that time were in the firing line and they occupied trenches on the advanced side of Chocolate Hill about 1½ miles from Stanford's dressing station. No serious fighting occurred in that area during August 7 and consequently no advanced bearer post became necessary, bearers being sent out as necessary and bringing in the few casualties, which had mostly occurred during the landing, straight back to the dressing station, whence Stanford evacuated them direct to the hospital ship which lay off in readiness.

That night a slight advance took place and it became necessary to establish a bearer post on the reverse side of Chocolate Hill, a quarter of a mile in rear of the South Staffords' regimental aid post. Sparrow with his "C" bearers occupied this bearer post by day, Meyne with the "A" bearers relieving him at night. Casualties were few and the majority of the wounds not serious.

(To be continued.)

Clinical and Practical Notes.

A CASE OF SEPTICÆMIA

[illegible] R. W. G. STEWART, O.B.E., M.B., D.T.M. [illegible]

[illegible] of acute bacterial blood infection is recorded [illegible] est and the result so striking and so rare.

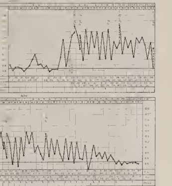
[illegible] was admitted into R.N. Hospital, Plymouth [illegible] April 1, [illegible]

[illegible] rash on the trunk and slight catarrhal symptoms were [illegible] presented no unusual features. Temperature [illegible] hours after admission, with the exception of a slight [illegible] April [illegible] when a cold in the head was complained of. Nothing [illegible] April 10 [illegible] evening, temperature rose to 103.6° F. [illegible] sore throat, nasal catarrh and general malaise [illegible] Bacteriological examination of throat swab [illegible] later the morning temperature was 101.4 [illegible] General pains of [illegible] character [illegible] of the left nostril were complained of. At [illegible] temperature rose to [illegible] followed by profuse sweating. [illegible] temperature [illegible] Pulse [illegible] 104. Respirations 32. [illegible] examination of the chest [illegible] there was some [illegible] region. A leucocyte count gave the following [illegible] polymorphs 80.0 per cent, lymphocytes [illegible] (aspirin 10 gr. [illegible]) Another [illegible] hour later. During [illegible] followed by profuse sweating.

[illegible] Pulse 108. Respirations [illegible] inability to breath through the [illegible] and discharge from the [illegible] a pure [illegible] purulent discharge from nose [illegible] good movement [illegible] No tenderness [illegible] healthy [illegible] rigidity or distension [illegible] lungs. Slight cough [illegible] Cultures were [illegible] of organisms. [illegible] blood infection [illegible] blood were taken for culture. Twelve hours [illegible] pure culture and subsequent investigations [illegible] group and [illegible], the sugar reactions of [illegible] the blood infection was of a very virulent [illegible]

TREATMENT.

[illegible] [illegible] decided to perform blood [illegible] Meanwhile [illegible] injected intramuscularly [illegible] blood [illegible] April 16 and 18 transfusion with 500 c.c. [illegible] blood was [illegible] On each occasion the donor was given a [illegible] injection of [illegible] nucleinate three hours previous with the [illegible] a leucocytosis.



On April 17 N A B 0.6 gram was given intravenously Two rigors in quick succession occurred after the second transfusion the temperature rising to 103.4° F No immediate improvement was evident as the result of blood trans lision [illegible] his colour was more dusky and diastol[illegible] Hord [illegible] of embolic phenomena gave cause [illegible] [illegible] shoulder and elbow joints, an erythe[illegible] [illegible] and petechiae on abdomen and chest [illegible] [illegible] shoulder joint and for several days the patient [illegible] Pyrexia was still severe and of an intermittent [illegible] sweating occurred Mental state was com[illegible] [illegible] the exception of slight delirium at times [illegible] troublesome Spleen not palpable Tongue [illegible] Heart sounds normal Pulse soft but rate [illegible] With the exception of joint pains and nasal [illegible] in fact almost invariably stated that [illegible] symptoms by its entire absence Urine [illegible] some red blood cells, and a few granular [illegible]

[illegible]

[illegible] published of cases of acute bacterial [illegible] injections of perchloride of mercury it [illegible] Accordingly 5 c c of a 1 in 1,000 [illegible] saline was given intravenously on [illegible] twenty four hour intervals over [illegible] the first injection a very intense rigor [illegible] the temperature rising to 106 2 [illegible] but another rigor took place [illegible]

[illegible] was performed, the donor [illegible] received an injection of sodium [illegible]

[illegible] but was less severe than usual [illegible]

[illegible] improvement Pulse was on the [illegible] Blood pressure [illegible] and patient's general condition [illegible] anxiety [illegible] however, that during the past [illegible] and [illegible] temperature were lower than during [illegible] As [illegible] resulted from the intravenous [illegible] parable [illegible] the metal could now be detected in [illegible] further [illegible] This was carried out at [illegible] between April 10 and May [illegible] and was well tolerated No [illegible] or any complications developed

[illegible] red blood cells 3,370,000 [illegible] per cent Colour index [illegible] [illegible] was more satisfactory than was to be expected [illegible] Sodium cacodylate [illegible] doses was given intra[illegible] [illegible] the next four days

[illegible] occurred lasting about twenty minutes Temperature [illegible] It was noted with satisfaction however that an interval of [illegible] had elapsed since the last rigor Patient was also looking better had an [illegible] appetite, and sleeping well

C [illegible]

M[illegible] This drug was prescribed in 50 gr doses to be taken three times daily [illegible] by 90 gr doses of sodium citrate half an hour previously with the object of keeping the urine alkaline Three days later the dose of urotropin was increased to 100 gr three times daily This dose was given for one week and 50 gr doses continued until May 29 and then gradually reduced On June 8 the administration of this drug was discontinued For the past two days patient had complained o[illegible] [illegible] [illegible]minal pain but nothing abnormal was detected on examination

May 11.—S[illegible] [illegible] [illegible] referred to right lumbar region and right hip joint

May 13.—Al[illegible] [illegible] [illegible] present and referred chiefly to the right iliac region. No loc[illegible] [illegible] swelling distension or rigidity. Some anxiety was felt regarding the [illegible] cause of these pains. As however no rigors had taken place during the [illegible] week and temperature was gradually dropping the prognosis now ap[illegible] [illegible] [illegible]

May 13-15.—D[illegible] [illegible] patient suffered from severe abdominal distension which [illegible] [illegible] and proved very resistant to treatment. It ultimately [illegible] [illegible] and turpentine stupes and enemata. Severe pain was also still present in the right lumbar region and there was marked tenderness on pressure [illegible] [illegible]. Nothing abnormal was detected in the urine. The g[illegible] [illegible] patient was rapidly improving; no rigors had taken place since M[illegible] [illegible] [illegible] had now practically reached normal.

May 19.—Red blood cells [illegible] 000 per c.mm.; white blood cells [illegible] per c.mm.; hb. 70 per c[illegible] [illegible] 0.74.

From this date [illegible] progress was maintained and convalescence rapidly established.

General Treatment

This was carried out on the [illegible] lines. Oxygen was administered for ten minutes every hour from April [illegible] to May 18, and patient was got out into the fresh air and sun[illegible] [illegible] condition permitted.

Brandy in teaspoonful doses was administered throughout twice daily in egg flip.

A liberal diet w[illegible] [illegible] first fortnight of the illness. Drugs prescribed included [illegible] in large doses and pulv. ipecac. [illegible] (one powder daily from April [illegible] to May 14). D[illegible] one to one and a half tablets proved very reliable and [illegible] [illegible]. Constipation was troublesome but was relieved by [illegible] [illegible].

Local treatment was [illegible] to the nose and naso-pharynx.

[illegible]

As to which line of treatment [illegible] [illegible] most helpful I am satisfied that they all contributed to the [illegible] result. The blood transfusion [illegible] value in [illegible] the blood volume and also [illegible] [illegible] the [illegible] healthy young [illegible] [illegible] [illegible] had some effect [illegible] [illegible] and the final settling of the temperature [illegible].

I desire to express my appreciation of the most valuable assistance which I received [illegible] [illegible] [illegible] Sister C. M[illegible] [illegible] [illegible] [illegible] consultation. [illegible] [illegible] the [illegible] treatment of the [illegible] [illegible].

My sincere thanks are due to [illegible] [illegible] W[illegible] Pathologist to the South [illegible] Hospital [illegible] [illegible] [illegible] [illegible] the blood transfusion [illegible] Surgeon Commander [illegible] R.N. [illegible] [illegible].

Great praise is also due to the [illegible] [illegible] staff for their excellent [illegible].

[illegible] INFIRMARY [illegible]

[illegible] ROBINSON [illegible]

[illegible] December [illegible] and [illegible] put [illegible]

[illegible] the ulcer [illegible] operation had to [illegible] and [illegible]

[illegible] of tenderness [illegible] On [illegible] March [illegible]

[illegible]

[illegible] to the cutaneous branch [illegible]

[illegible] TIBIA (SCHLATTER'S DISEASE)

[illegible] the box horse on August 20 [illegible] very distended [illegible] piece of bone and [illegible] The joint was [illegible] applied and, the [illegible] The knee joint [illegible] of six tibia was then fixed into [illegible] with catgut [illegible] with full [illegible]

[illegible] R.M., aged 19 [illegible] 1926 slipped in barrack room [illegible] X ray shows [illegible] to be detached. Firm [illegible] applied for one month without [illegible] operation [illegible] was adopted and patient is [illegible] duty but has [illegible] present.

THREE SURGICAL CASES

[illegible] COMMANDER A. R. THOMAS [illegible]

AND

[illegible] LIEUTENANT COMMANDER M. [illegible]

[illegible] described are not [illegible] they present [illegible] uncommon in Service practice.

[illegible] FISTULA. [illegible]

[illegible] was admitted [illegible]

[illegible] present for [illegible]

[illegible]

[illegible] oblique [illegible] was expected [illegible] from the left [illegible] graft was successfully [illegible]

[illegible] was [illegible] for carcinoma [illegible] symptoms and the abdominal [illegible]

[illegible] transplant [illegible] the fibrous tissues in the repair of anatomical defects [illegible] by W. [illegible] and A. B. Le Mesurier in *The British Journal of* [illegible] October [illegible]

[illegible] Ulnar Paralysis

[illegible] was admitted on May 29 1925. In June 1922 he was [illegible] He sustained a gunshot wound [illegible] in the lower third of the forearm. After [illegible] he underwent an operation which he thought was [illegible] A good functional recovery resulted.

[illegible] engaged in playing leap frog during running drill he [illegible] the right forearm. Half an hour later he was unable [illegible] noticed that his fingers particularly the ring and little [illegible]

[illegible] picture was that associated with incomplete division [illegible] the dorsal branch. There was no reaction of de[illegible] showed many small metallic fragments scattered [illegible] improvement resulted from treatment by careful splinting [illegible]

[illegible] nerve was exposed and thoroughly cleared from much [illegible] immediately above the wrist and extending [illegible] was a spindle shaped swelling of the nerve. Its [illegible] There were indications of fairly recent haemorrhage [illegible] of a sterile electrode proved that all the motor [illegible] but a strong stimulus had to be used to elicit [illegible]

[illegible] tissues in the neighbourhood and the length of the [illegible] portion of fascia lata was fixed in position to form a [illegible] its original bed. The nerve was not stretched and [illegible] The wound healed by first intention.

[illegible] operation loss [illegible] was present and there was [illegible] Definitely increased power of flexion of [illegible] on the second day. On the third day [illegible] the ring finger and as far as the root of the little [illegible]

[illegible] table included the following: —

[illegible] current at motor point.

[illegible] response to galvanic current.

[illegible] responded to faradic stimulation.

[illegible] third and little finger.

[illegible] All [illegible] well and there was no tendency for deformity to [illegible]

[illegible] sensory abnormality persist[illegible] over the ulnar border of the terminal phalanx of [illegible]

[illegible] hospital on September 14 1925 and has had no [illegible]

[illegible] the mode of onset of the symptoms and the [illegible] suggest that sudden overstretching of the spindle shaped [illegible] the nerve by haemorrhage in its vicinity were the [illegible]

[illegible]

[illegible] R. A. N. aged [illegible] was first admitted on February 5 [illegible]

[illegible] when he was 24 years of age [illegible] boats [illegible] severity which recurred [illegible]. His [illegible] having [illegible] had been [illegible] perhaps worth mentioning. [illegible] Hospital failed to [illegible] of dysenteric or enteric infection [illegible] of dyspepsia of many years standing.

[illegible] 1925 he had an attack of acute epigastric pain [illegible] was demonstrated. Operation was advised [illegible] he was discharged at his own [illegible].

[illegible] with a severe colicky seizure. [illegible] result.

[illegible] measures for biliary cases [illegible] gall bladder packed with stones [illegible] operation and the [illegible] hospital.

[illegible] complete relief from his old [illegible] April [illegible] and he left hospital on April [illegible].

[illegible] With one exception [illegible] a large almost spherical stone [illegible] was impacted in the cystic [illegible]. The stones were placed on [illegible] although no indication of th[illegible].

[illegible] have been recorded [illegible] naval officer of [illegible].

[illegible] OF SUPPURATIVE APPENDICITIS OPERATED ON AT SEA

[illegible] D.S.O., R.N. [illegible]

[illegible] acute abdominal [illegible] 26, 1926. We were [illegible] the ship rolling heavily [illegible]. He was turned in [illegible] and temperature were to be reported [illegible] was seen by Surgeon Lieutenant McVicker [illegible] together. The bowels [illegible] his temperature was 100° F. [illegible] breathing was thoracic [illegible] these circumstances [illegible].

[illegible] the Battle incision or transverse approach [illegible] the appendix [illegible] of the pelvic brim [illegible] He was [illegible] experience with [illegible] to take his place at the operation [illegible]. He was very quick [illegible] up to the wound and [illegible] the appendix was [illegible]. A silk suture was [illegible] and the appendix removed. The patient's condition [illegible] and the wound was closed as quickly as possible.

The aft[illegible] [illegible] ... [illegible]ful consul[illegible] ... [illegible] had [illegible] ... [illegible]. The [illegible] ... [illegible] removed and [illegible] ... [illegible]. His dressings were then changed [illegible] ...

[illegible] Military Hospital [illegible] convalescence. [illegible] ... to the sick bay. The main [illegible] ... [illegible] operation even under the best conditions [illegible] ... is due to Surgeon Lieutenant McVicker and our thanks are due to the [illegible] staff for their assistance.

WELLCOME HISTORICAL MEDICAL MUSEUM

The Wellcome Historical Medical Museum, 54a, Wigmore Street, W.1, [illegible] ... The work of reorganization is still proceeding, and when completed the arrangement and classification of the collections will be [illegible] ... objects made more accessible for inspection and study [illegible] ... members of the medical profession, chemists, pharmacists [illegible] ... generally from 9 a.m. to 6 p.m. on week days, except [illegible] ... the Museum is closed at 1 p.m.

Surgical Notes.

By [illegible] CHARLES L. WARREN, O.B.E., M.B., R.N.

[illegible] OF THE GLANDS IN THE ILEO-CÆCAL ANGLE

[illegible] in the *British Journal of Surgery*, January, 1925, discusses [illegible] glands in the ileo-cæcal angle which is one of the causes of [illegible] right iliac fossa.

[illegible] usually chronic in adults, often a sequel of an infection in [illegible] ... of diagnosis by means of X rays.

[illegible] ... as a rule ... of [illegible] nervous temperament. [illegible] ... which occasionally becomes severe ... above [illegible] ... Renal disease may be suggested when the gland presses [illegible] ... iliac fossa. Localised tenderness is present, but there is no [illegible] ...

[illegible] is thought to be a local peritonitis due to the irritation [illegible] ... The more acute cases simulate appendicitis [illegible] ... the neighbourhood of the ureter renal colic then [illegible] ...

[illegible] the following points for the diagnosis of calcified mesenteric [illegible] ... examination. Calcified mesenteric glands are usually [illegible] ... and indistinct and their appearance is mottled [illegible] ... palpation and when multiple their relative positions are [illegible] ... on deep respiration and then take a marked inward [illegible] ... When viewed from behind, they are larger than when [illegible] ...

[illegible] ... on the other hand usually single, only about [illegible] ... Their shadows are at a higher level as a rule, move [illegible] ... on respiration and cannot be freely moved by [illegible] ... smaller when viewed from the back than they do when [illegible] and when multiple [illegible] keep the [illegible] on [illegible] Then [illegible] generally sharply [illegible] and [illegible] homogeneous.

[illegible] site for phlebolith is in the pelvis. [illegible] that there is [illegible] natural cure and [illegible] tolerance may be inadvisable as a large [illegible] glands [illegible] the abdomen is opened the appendix should be [illegible] attacks of pain might suggest appendicitis [illegible] may be removed [illegible] the blood supply of the bowel [illegible] by means of an omental [illegible]

[illegible] also necessary [illegible] attempt the removal of a diseased [illegible] small or large intestine [illegible]

[illegible]

[illegible] the operation of [illegible] with the end-results [illegible] of [illegible]

The indications [illegible] (2) [illegible] stricture that [illegible] (3) [illegible] with a perineal fistula [illegible] fistula persists [illegible] of the stricture [illegible] on account of [illegible]

[illegible] indication.

[illegible] (1) Marked [illegible] (2) [illegible] (3) [illegible]

[illegible] conditions (1) [illegible]

[illegible] should be opened [illegible]

[illegible]

[illegible] the operation [illegible]

Hemorrhage.—[illegible]

[illegible]

[illegible]

Notes on Tropical Medicine

[illegible] W. BASSETT-SMITH
[illegible] C.M.G., F.R.C.P., F.R.C.S., R.N. (Retd.)

[illegible] GENERAL PARALYSIS OF THE INSANE. Warrington [illegible] February, 1926.

[illegible] upon general paralytics infected with malarial [illegible] the author concludes that the incubative period [illegible] days after the bite of the infecting mosquitoes and [illegible] in the blood for the first time in from thirteen to [illegible]

[illegible] to have any action upon the sporozoites injected by [illegible] doses of 10 gr. in solution are continued for ten [illegible] the disease does not develop. For cure [illegible] for only a few days were sufficient either [illegible] or at least to control it for a period of fifteen [illegible] the factor governing the question of relapse [illegible] mechanism of cure depending upon the fact that [illegible] or indirectly, large numbers of malarial [illegible] quantity of soluble antigen. This antigen [illegible] an immune body, and if this immune [illegible] the remaining malarial parasites thus [illegible] necessary to accept the hypothesis that the [illegible] parasites in the body and that a sufficient [illegible] produced. Quinine given when the blood shows [illegible] too much quinine may exhaust the [illegible] (It must be remembered that [illegible] examination they may still be present in [illegible] in the tropics are very different from those found [illegible] in England.)

[illegible] TREATMENT OF THE AFTER PAINS OF DENGUE FEVER [illegible] *Roy. Soc. Trop. Med. and Hyg.* 1926. February 18 [illegible] pp. 493-494.

[illegible] where the subsequent rheumatic-like pains were [illegible] they [illegible] rapidly and greatly relieved by [illegible] doses three times a day. These pains came on [illegible] fever had passed off and were always most severe [illegible] of the body. It is stated that though colchicum does [illegible] progress of the disease it however affords prompt and [illegible] pain and immobility which are the most prominent and [illegible]

[illegible] EPIDEMIOLOGICAL AND CLINICAL RECURRENTS. [illegible] Brea. *Bull. [illegible] Med.* 1926. March, vol. xci [illegible]

[illegible] sixty-five cases of relapsing fever in Spain. These [illegible] can type and specially affected men working in the fields [illegible] carrier was believed to be a species of tick *Ornithodoros* [illegible] in the piggeries. From some of these ticks Brumpt [illegible] young rats. So far there is no evidence that the pig [illegible] This work is of great interest for European relapsing [illegible] to infection of the spirochaete by lice.

Notes on Bacteriology.

THE DISINFECTION OF FRUIT AND VEGETABLES

By Surgeon Commander J. L. PRISTON, R.N.

A most interesting paper on this subject has been published to which a reference is given below. It is well known that human fæces are commonly used as manure in the East. Such fæces are applied to vegetables mixed with water and sprayed or thrown over the growing plants. It is said that the practice is commoner in Europe and America than is usually supposed. There is an obvious probability that vegetables like lettuce, salad vegetables, strawberries and watercress will be contaminated with bacteria, amœbic cysts and helminth ova when treated in this way. Cholera, enteric fever, dysentery or parasitic infestation may result in those who eat the produce.

Even when fruits and vegetables are not manured with human fæces they are extremely likely to become more or less contaminated with dangerous organisms before they are eaten. Vegetables and fruits are often refreshed by sprinkling them with water which is usually dirty and contaminated; they are handled by many people with dirty hands between the market garden and the consumer; flies and other insects frequently alight on fruit.

It has been found that *Bacillus coli* is very common on the surface of fruits, and that the number of these organisms increases steadily the more the produce is handled. This may be taken as distinct evidence of fæcal contamination to some extent of all fruits and vegetables as commonly sold.

Pathogenic bacteria may persist on the surface of fruits and vegetables kept under moist conditions for fifteen days or more, but they do not penetrate through the unbroken skin, nor can any organism pathogenic to man gain access to the inside of fruits by being taken up from the soil through the roots of the plant. Such bacteria can penetrate bruised and damaged parts of a fruit and grow locally but they cannot spread into the normal undamaged parts.

It seems that any contaminated fruit can be eaten safely if the outside can be disinfected properly, but this is not easy without spoiling the fruit. Immersion in water chlorinated to the extent of ten parts of chlorine per million for fifteen minutes will kill all non-sporing bacteria; suitable solutions of potassium permanganate, iodine or strong alcohol will also kill bacteria within a quarter of an hour, but none of these disinfectants in any practicable strength will kill amœbic cysts or helminth ova in a reasonable time. Flaming with alcohol will not kill all amœbic cysts, nor will strong formalin kill helminth ova.

The best method of sterilizing fruit and vegetables is probably as follows:—

(1) Wash thoroughly in running water all articles intended to be eaten raw in order to clear away clumps of bacteria, cysts, or ova that may be attached to the surface. Separate such vegetables as cabbage and lettuce so that each leaf will be treated separately. Cut off all stem ends of vegetables and remove injured and decayed portions.

(2) Submerge the fruits and vegetables in boiling water by means of a stove or spoon for a period of ten to thirty seconds. Use a vessel of boiling water of such a size that the introduction of the food materials will not greatly reduce the temperature, at least not below 80° C.

(3) Freshen in cold boiled water or in the refrigerator.

All fruits and vegetables which are eaten raw in countries where sanitation is defective should be treated by this method; any other method of disinfection is probably only partial. It is insufficient merely to pour boiling water over the food, as the water cools too rapidly.

REFERENCE

Mills, R. G.; Bartlett, C. L., and Kessel, J. F. Amer. Journ. Hyg., 1925, v, 559-8.

Reviews.

[illegible] Louis Hopewell Bauer M D [illegible] of Aviation Medicine Baltimore [illegible] English Agents, Messrs Baillière Tindall and Cox [illegible] Thirty five illustrations Price [illegible]

[illegible] complete work on the subject published in America [illegible] when viewed from an American aspect, but it must [illegible] possesses its controversies

[illegible] parts arranged in a pleasing manner The first [illegible] of the flyer and the physical and mental [illegible] work should possess The general physical [illegible] special senses are described in detail The [illegible] "neuro psychic" or personality examination In [illegible] against the popularly assigned importance of the [illegible] in this function

[illegible] with the physiology of aviation the effects of cold [illegible] tolerance of altitude

[illegible] to the care and the maintenance of the physical [illegible] with a description of various special tests and [illegible] examination which latter are different to those used in [illegible]

[illegible] basis for the tests used by the American School [illegible] the American "Ruggles Orientator" to the English [illegible] Machine [illegible] reaction time test but confesses that apart from these [illegible]—the [illegible] which is still in its infancy—there are no reaction time tests of any practical [illegible] The French Italian and German tests in this connection are also described

The [illegible] expressed on the value of mass athletics against those of a competitive [illegible] but at the same time a warning note is issued that exercise alone will not keep a man in good physical condition The portions devoted to fatigue staleness and physical fitness are of general as well as of special interest to the medical officer connected with aviation

The summaries and references at the ends of the chapters are concise and well arranged

A very successful effort has been made to collect and correlate the widely scattered literature on aviation medicine in an admirable bibliography

The book makes a welcome addition to the library of all medical officers connected with this special branch of medicine but we should like to have seen it produced at a lower price F L S

Modern Views on Digestive and Gastric Diseases By Hugh Maclean M D D Sc M R C P Professor of Medicine University of London and Director of the Medical Clinic St Thomas's Hospital, to London Constable and Co Ltd 1926 Price 12s net

It would be difficult to find a more concise and instructive account of gastric [illegible] than is contained in this book which should prove of great value to [illegible] physicians A perusal of this interesting work will certainly enable [illegible] to feel more confidence in themselves, with advantage to their patients [illegible] old and well established observations are confirmed others have been [illegible] in addition new light of an almost revolutionary nature is revealed

Attention should be invited particularly to the following landmarks viz —

1 The history of the case is the most important of those for the pl[illegible]
[illegible]

(2) Short duration of gastric symptoms in carcinoma of the stomach
(3) Fractional test meal
(4) Regurgitation of the alkaline contents of the duodenum into the stomach as part of the normal act of digestion

With a view to shew how simple this complex subject has been made by the author the following remarks are made for the guidance of readers viz. —

Chapter 1 —The normal stomach is a movable organ at times nearly vertically placed has a tubular shape and the lower part reaches down to the region of the umbilicus

The relative position of the stomach to the heart is so contiguous that any person suffering from myocardial degeneration should eat small meals and so prevent embarrassment of the heart's action

Regurgitation of duodenal contents through the pylorus as a part of normal gastric digestion is a theory of intense interest.

"The mechanism by which the pancreatic juice is driven back into the stomach depends on an irritation of the intestines by acid fluid from the stomach" This irritation provokes "antiperistalsis which drives the alkaline secretion of the intestine until a sufficient amount accumulates which is capable of lowering the acidity of its contents

All of us are familiar with vomit containing bile which takes place in gastric cases This "acid control of the pylorus" is dependent on the principle that acid in the stomach causes a relaxation of the sphincter while on the contrary acid in the duodenum causes contraction

Chapter 2 — It may be advantageous to recapitulate shortly the various chemical changes which food undergoes in the alimentary canal In the mouth some of the starchy material is changed into sugar while both fats and proteins undergo no change

In the stomach proteins are broken down into proteoses and peptones by the pepsin of the gastric juice at the same time the action of saliva on starch is to some extent continued Fat is so far unacted upon

On reaching the duodenum and upper part of the jejunum the proteoses and peptones of the gastric digestion are further split up into amino acids by the pancreatic trypsin Fat is at the same time hydrolysed into glycerol and fatty acids while any starch that has escaped the action of the ptyalin is converted into sugar by the amylase

"In the small intestines also any proteose and peptone that has escaped the action of trypsin is changed into amino acids by erepsin The end products of food digestion present in the small intestine at the completion of digestion are therefore amino acids glucose and fatty acids In this form the different classes of foodstuffs are ultimately absorbed"

The real and important site of absorption of food is the small intestine and little or none from the stomach

Chapters 3 *and* 8 give a detailed account of the fractional test meal

Chapter 1 enumerates briefly the chief gastric diseases and symptoms and the author clearly defines the importance for the practitioner to make out if the disease is —

(*a*) Functional, or

(*b*) Organic { Gastritis / Ulcers / Cancer

When pressure elicits definite pain some organic lesion is present and anacidity of the gastric contents is associated with —

Gastric cancer

Pernicious anæmia
Gastritis i.e. chronic gastric catarrh

Chapter 5.—Ulceration of the stomach and duodenum are now so common a feature in everyday life that an urgent call was necessary for a clear account and pronouncement on them, and that is given here. The most common form of peptic ulcer is a chronic lesion situated on one side or other of the pyloric orifice, and very rarely does it become carcinomatous.

Chapter 6.—The author states, "with regard to the ætiology of cancer, we know practically nothing." It is most refreshing to meet with such an outburst of candour on this distressing subject and so reduces cessation to the level of our present knowledge. The so called "cancer campaigns" which have been exploited in this country of recent times have had the undesirable effect of alarming the public and tend to fill the pockets of charlatans; if the aim of such propaganda is to raise funds for further research, there are other methods of attaining this desirable end with less ostentation. A public grant should be available.

In cancer there is an average previous history of symptoms of six and a half months, and in ulcer of over seven years.

Absence of hydrochloric acid and the presence of appreciable amounts of lactic acid in the test meal is the usual rule in carcinoma of the stomach. Operation is then advised without hesitation for any patient who shows lactic acid in appreciable amount, provided the circumstances do not entirely militate against the probability of cancer, and the general condition does not contra-indicate operative interference.

Chapter 9.—The radiological examination of the alimentary canal. Here the author is succinct and much to the point of clarity: "In the radiological investigation of the alimentary tract it is of the greatest importance that the examination should be carried out by a medical man who is in the truest sense an expert radiologist. The true function of the radiologist should be recognized, i.e. to supply to the clinician an ocular demonstration of the abnormal conditions of the part. He must never be relied upon solely to supply a diagnosis, but his results should be looked upon as evidence to support a provisional diagnosis or to exclude one or more possible conditions, thus narrowing down the field of search. The clinician will supply the evidence of his senses, his patient's history, the results of test meals, the reports of the pathologist, and by adding the radiologist's report will have as complete a survey of his patient's condition as is humanly possible under present circumstances."

There are 18 illustrations demonstrating by artificial barium or bismuth meal most of the ordinary lesions to be encountered from pyorrhœa alveolaris to pyloric obstruction.

Chapter 10 is devoted to treatment of gastric diseases, and emphasis is laid that successful treatment depends upon a recognition of the cause of the condition present and a knowledge of the physiological processes involved in digestion.

Treatment of ulcer is carried out as of yore but on much more intelligent and rational lines.

The following constitute the sheet anchor of successful treatment, viz., alkalies, oils and fats (olive oil, butter and cream), belladonna or atropine (to inhibit secretion), food of a bland nature and taken in small quantities, smoking and alcohol are forbidden, prolonged rest in bed, and avoidance of worry; then if medical treatment fails, as it will do sometimes, surgical intervention is indicated, but it must be clearly understood that surgery is not necessarily a cure for all gastric ailments in which symptoms depend on ulceration; operation seems to be more effective in providing permanent benefit when carried out in private patients than it is in the hospital class, probably due to the greater discretion and care the former exercise. Surgery should never be resorted to in ulcer cases until medical treatment has failed, and if this occurs the treatment already given must in all probability have improved the condition of the stomach for operation.

In all cases it is advisable to exclude injury, have a Wassermann reaction done look for evidence of adenitis at root of neck and do not overlook the gall bladder

The author is to be congratulated on the production of such a valuable book

R. J. Mack.

Manipulative Surgery By A G Timbrell Fisher M C F R C S, Surgeon Seamen's Hospital, Greenwich &c Pp 168 62 illustrations London H K Lewis and Co, Ltd 1925 Price 7s 6d net.

Mr Timbrell Fisher has followed up his work on Internal Derangement of the Knee Joint with this little manual on 'Manipulative Surgery, and it should be read in conjunction with the previous work Most surgeons have been aware for years that cases which have benefited little from the treatment given by the orthodox practitioner have undergone apparently miraculous cures at the hands of the more or less anatomically and physiologically ignorant bonesetters With praiseworthy industry and enterprise Mr Fisher has laid himself out to learn to imitate what is good and avoid what is bad in the practice of bonesetters, and to give this knowledge the sound anatomical and physiological basis without which Sir James Paget's advice quoted above is of little value For this work Mr Fisher is by qualifications and experience particularly well equipped and the results of his labours are embodied in this valuable little book To the medical man who has been brought up on Hilton's Rest and Pain the ideas expressed are revolutionary but there can be no doubt the renaissance has been long delayed That pain does not necessarily correlate rest is proved up to the hilt and that a short sharp pain by an experienced manipulator may obviate a more prolonged pain and cure a disability which no other method can alleviate is demonstrated without fallacy Old prejudices die hard we still touch wood and throw spilled salt over our left shoulders So it is too much to expect that the treatment so soundly advocated by Mr Fisher will at once displace the conservative treatment of the older practitioner But the root of the matter is here and in the minds of those who are not too hardened by lack of culture this knowledge will flourish until long ere Mr Fisher reaches his prime we believe that he will see the fruition of his labours Then will right diagnosis precede right treatment and Sir James Paget's advice will no longer be necessary

J. E. M.

The Diagnosis and Treatment of Tuberculosis of the Hip By G R Girdlestone B M Oxon F R C S Hon Surgeon Wingfield Orthopaedic Hospital Oxford Hon Consulting Orthopaedic Surgeon Shropshire Orthopaedic Hospital Hon Consulting Surgeon Children's Orthopaedic Hospital Bath Children's Hospital, Cold Ash Savernake Hospital Marlborough Hon Orthopaedic Surgeon King Edward VII Hospital, Windsor Royal Bucks Hospital Aylesbury Assistant Hon Orthopaedic Surgeon Radcliffe Infirmary Oxford London Humphrey Milford Oxford University Press Price 8s 6d net

This treatise on the diagnosis and treatment of tuberculous disease of the hip deals with this subject on entirely modern methods of early diagnosis and treatment

Part I Diagnosis —This section gives the practitioner most useful aid in the early diagnosis of this disease and if the author's advice is followed then the cases of tuberculous disease will be missed while they are still at a very early stage and will so receive adequate treatment which is all important for the cure of this complaint or a satisfactory end result

Part II Treatment —In this section up to date treatment is clearly set forth The description of the treatment is excellent but the practitioner or casual medical officer who occasionally has to treat these cases without sending them to a sanatorium would welcome a much fuller description of the various splints mentioned and also a chapter dealing with the nursing of the cases when fitted with the splints

Operations are advised by the author for certain conditions of the disease. More definite detail of these operations would be of great value to the surgeon who is not constantly treating cases of tubercular disease of hip

PART III Illustrates end results and is both interesting and instructive

G F S

AN INTRODUCTION TO THE STUDY OF X RAYS AND RADIUM By Hector A Colwell M B Lond , D P H Oxon and Cecil P G Wakely F R C S Eng , F R S Edin Oxford Medical Publications London Humphrey Milford, Oxford University Press 1926 Pp xiv + 203 Price 10s 6d net

This book as stated in the preface is intended for those studying in a medical school who have access to a radiological department as part of their professional training and to whom even the elementary principles of the subject are not familiar

An interesting account is given of the preparation of radium salts and of the manufacture of radon applicators for therapeutic purposes A simple and [illegible] account is given of the atomic theory

In general the subject under discussion is dealt with in chronological order [illegible] interesting reading The chapter on the actions of radiation upon [illegible] tissues with some notes on their chemical action should certainly [illegible] readers to consult Colwell and Russ's Radium X rays and the Living Cell [illegible] edition (Bell)

[illegible] pages are given to the recommendations of the X ray and Radium Protection Committee In short there is an amount of useful information in this book not likely to have been dealt with in any one book

The authors apologise in the preface for the inclusion of (1) Chapter III Notes on Induction and (2) a note at the end of the book on Index Notation, stating that these are included at the request of " several of our students " The chapter on Induction is of such an elementary nature that its contents would hardly suffice to obtain pass marks in the Preliminary Scientific Examination Physics) for medical students, and to serve a useful purpose should be increased in scope

It is difficult to understand why three pages are taken up by Index Notation, a subject which should undoubtedly be familiar to all present day students

Readers for whom it has been considered necessary to insert the construction to elucidate the law of inverse squares (fig 3) will no doubt be duly impressed by the hypothetical construction to show orbits of electrons in the radium atom, page 175 (from Millikan's " The Electron ")

The book should be very useful for the purpose for which it is written It is beautifully published and shows evidence of very careful proof reading

A L R

A PRACTICAL HANDBOOK ON RAT DESTRUCTION By C Leopold Claremont B Sc F I C Recently Research Chemist in Charge Rat Research Department Ministry of Agriculture London John Hart

This book is written primarily for those officers of local authorities who have to administer and carry out the Rats and Mice (Destruction) Act of 1919 The author has unique experience in the problem of rat destruction and deals with the subject in such a simple and interesting manner that the book is read at one sitting All that is necessary is present and nothing appears superfluous The book is essentially practical and should be in the hands of all rat officers and also of any occupiers who under the 1919 Act are or should be interested in rat destruction

C H D

[illegible] By E W Hope O B E, M.D, D Sc [illegible] University of Liverpool, and C O Stallybrass, [illegible] D H City of Liverpool Ninth Edition revised [illegible] Edinburgh E and S Livingstone 1926 Pp 340 + x [illegible] illustrations Price 15s net

The [illegible] object of this work is to provide a textbook for medical students [illegible] qualified practitioners who are reading for the Diploma of Public [illegible] but the authors hope that it will not be without interest to a larger public [illegible] present edition has been rearranged and largely rewritten and thirty new [illegible] have been added A really remarkable amount of information has [illegible] used into a small and handy book and it should be invaluable to those [illegible] for examinations or requiring a book of reference The facts appear to be [illegible] and up to date throughout but the condensation necessary to include [illegible] small book makes it impossible to give much explanation of the facts [illegible] requires a more detailed account of some of the fundamental [illegible] of hygiene than can be found in this book Those reading for [illegible] usually attend courses of lectures where such information is given [illegible] could be used to refresh the memory afterwards The subjects [illegible] the entire syllabus for the examinations for the Diploma of [illegible] excepting the practical laboratory and field work and bacteriology [illegible] is given of Legislation affecting Public Health Vital Statistics [illegible] the Welfare of Motherhood and Infancy and Occupational [illegible] illustrations are very good and the formation printing paper and [illegible] excellent

J [illegible] P

[illegible] OF THE PRACTICE OF MEDICINE By various Authors Edited by [illegible] W Price M D F R S Edin Second Edition Oxford [illegible] Publications London H Milford Oxford University Press 1926 [illegible]

Since the first edition of this textbook made its appearance in 1922 five [illegible] have been called for

The [illegible] now of a second edition is sufficient proof of the great demand [illegible] excellent work It is of exceptional merit and it is one of the most [illegible] at the present time not only with students but also with those engaged in the practice of medicine

The principle adopted of allotting a whole section to one author, or to two writing in collaboration has undoubtedly proved a great success

With those [illegible] few alterations the general arrangement and classification followed in the first edition is maintained

[illegible] amount of new matter has been added several articles have been wholly or largely rewritten and the book has been thoroughly revised and brought up to date

In the section on [illegible] infectious diseases an account is given of the Schick test [illegible] and the production of active immunization

The desirability of giving prophylactic injections of antitoxin on the outbreak [illegible] is discussed and it is observed that antitoxin does not prevent infection but only the toxic results of infection It [illegible] and may produce a condition of hypersensitiveness to serum [illegible] subsequently

Dealing with the pathology of scarlet fever reference is made to the evidence of Drs George and Gladys Dick [illegible] that scarlet fever is a local infection of the throat [illegible] streptococcus the Dick test being based on the production of localized inflammation by the intradermal injection of toxic filtrate

In the article on encephalitis lethargica attention is drawn to a group of cases in which the [illegible] manifestations are very slight and yet in the course of months or even years the most serious paralysis appears We also learn that symptoms indicative of lesion of the basal ganglia are among the most common features of the disease and are often the most persistent

Botulism is described in the section on food poisoning and it is interesting to note that contrary to the generally accepted views it was found by Meyer that the bacillus was a natural inhabitant of soil in its virgin state It was found more abundantly in soil from high mountains and virgin forests than in soil from crowded stockyards and highly cultivated gardens.

Diabetes mellitus is considered in Section VI (Diseases of Metabolism), and the information regarding the dietetic and insulin treatment of this disease will be found of great practical value In connection with restricted diet it is very important to note that removal of carbohydrates without reduction of the fat and protein is a dangerous practice and has in the past precipitated the onset of coma

A good description is given in Section XII (Diseases of the Circulatory System) of the graphic methods employed in examination of the cardiac mechanism Quinidine therapy is discussed at some length It is noted that among special indications for the administration of this drug is the occurrence of cardiac failure coincidently with the onset of the abnormal rhythm especially if any intolerance for digitalis or its allies has been observed

The work has already achieved a high reputation and can be thoroughly recommended to all naval medical officers. R. W G S

News of the Service.

OBITUARY.

[illegible] the untimely death of Lieutenant General Sir William Boog Leishman K.C.B. [illegible] F.R.S. [illegible] Director General of the Army Medical Service we feel [illegible] contrives of the R.A.M.C. the whole medical and scientific world have [illegible]

[illegible] graduated in 1886 at Glasgow University where his father was [illegible] and Obstetrics He joined the Army Medical Service [illegible] the following [illegible]

[illegible] that he was one of the first junior medical officers to take [illegible] the primary term of foreign service—an indication of his zeal for research [illegible] period of his career he worked on the bacteriological aspect of malaria and [illegible]

[illegible] the Waziristan Campaign he was appointed to [illegible] and thus [illegible] Sir Almroth Wright who at that time was Professor of Pathology [illegible] Assistant Professor of Pathology In such an atmosphere he [illegible] research work It was during this period he contracted Malta [illegible]

[illegible] his work is monumental His discoveries in anti-typhoid research [illegible] appreciation and his methods have been universally adopted [illegible] by the application of his technique the typhoid [illegible] has been diminished to an astonishing degree

[illegible] the invention of the stain which bears his name [illegible] staining technique.

[illegible] the [illegible] of his painstaking insight [illegible] in the group of diseases known as Leishmaniasis.

[illegible] the Great War he proceeded to France as the Expert in Tropical [illegible] and shortly after he became Adviser in Pathology to [illegible] In the latter days of the War he was filling many [illegible] To mention a few he was chairman of the research [illegible] adviser on all laboratories and [illegible] hospitals [illegible] adviser on tropical diseases [illegible] Commission member of the allied Surgical Co[illegible] Officer of Pathology in the inter-allied force &c

He was appointed Director of Pathology [illegible] John Goodwin as Director General of the Army Medical Services [illegible].

[illegible] was a member of the Medical Research Committee for ten years [illegible] Commission (1913–1915), member of the [illegible] and chairman of the Foot and Mouth Disease Research [illegible] examiner in pathology at Oxford [illegible].

He was elected a Fellow of the Royal [illegible] and filled the office of Vice-President. He had also served [illegible] Tropical Medicine and Hygiene and shortly before his death [illegible] the Section of Comparative Medicine of the Royal Society of Medicine [illegible] President of the War Section, Royal Society of Medicine.

His contributions to scientific literature [illegible] considerably enhanced by being the results of his [illegible]. The article on [illegible] in Allbutt and Rolleston's System of Medicine [illegible].

As a lecturer he possessed [illegible] but his expositions were concise and his pointed [illegible] to endless years to [illegible].

He was knighted in 1909 and [illegible] War he was mentioned in despatches on many occasions [illegible] in 1918 and K.C.B. [illegible]. He was a Companion of the [illegible] decorations included the Distinguished Service Medal [illegible].

His life was one of devotion [illegible] research. His [illegible] kindly [illegible] and [illegible] that he was ever willing to advise [illegible] himself to all [illegible].

He [illegible] Hospital. [illegible] General Sir Hugh [illegible] Major-General [illegible] MacPherson [illegible] Sir Joseph [illegible] Air Vice-Marshal [illegible].

The Medical Department of the [illegible].

To Lady [illegible].

We [illegible] of the following [illegible] Sir William Smith [illegible].

[illegible] Sir William [illegible]

[illegible]

Sir William [illegible]

[illegible]

[illegible] West Indies [illegible]

[illegible]

[illegible]

HONOURS

[illegible] on the occasion [illegible] Majesty's Birthday [illegible] the Most Honourable [illegible] Bath [illegible] Companion of the [illegible]

[illegible] Smallridge [illegible] M.R.C. [illegible]

[illegible] on the occasion [illegible] Majesty's Birthday [illegible] the Most Excellent Order [illegible] British Empire [illegible]

[illegible] R.B.C. [illegible] R.N.V.R. [illegible]

[illegible] of the [illegible] R.N.V.R. Officers' Decoration [illegible] M.B. R.N.V.R.

DEGREES AND DIPLOMAS

[illegible] M.B. F.R.C. [illegible] R.N. [illegible] Physicians (L.R.C.P. London) [illegible] M.B. M.R.C. [illegible] R.N. [illegible] of Physicians (Ireland) (M.R.C.P.I.) [illegible]

FOREIGN LANGUAGES—RESULT OF ANNUAL EXAMINATION, 1925

[illegible] of £30, Medal and Certificate of [illegible] the annual examination held in December 1925 [illegible] M.D. R.N.

PROMOTIONS

[illegible] Surgeon Captains [illegible] promoted to Surgeon Rear-Admiral [illegible] M.B. D.P.H. [illegible] 1926 [illegible] Reginald St. G. S. Bond, M.B. F.R.C.S. M.R.C. [illegible]

[illegible] Surgeon Commanders [illegible] promoted to Surgeon Captain [illegible] Arthur R. Thomas [illegible] M.B. B.A.

[illegible] Surgeon Commander [illegible]

[illegible]

[illegible] M.D. B.A. [illegible] D.S.C. [illegible]

[illegible] Ladwick [illegible]

[illegible]

Surgeon [illegible] M.V.O., O.B.E. [illegible] R.N.V.R. [illegible] dated June 30 [illegible]. Surgeon [illegible] Francis H. Watson [illegible] Commander, Emergency [illegible] Surgeon Commander, dated [illegible].

—

APPOINTMENTS

MARCH

[illegible] M.B., F.R.C.P., D.T.H., [illegible] Medical Department. [illegible] M.B., to R.N. Hospital, Hong [illegible] to H.M. Dockyard, Hong Kong [illegible] to R.N. Hospital, Hong Kong. Surgeon Lieutenant [illegible]

APRIL

[illegible] C.M.G., to R.N. Hospital, Chatham. Surgeon Rear-Admiral [illegible] F.R.C.S., to R.N. Hospital, Haslar. [illegible] Surgeon Commander J. [illegible] to *Furious* [illegible] M.B., to *Valiant*. Surgeon Lieutenant [illegible] Hospital, Bermuda. [illegible] Surgeon Lieutenant G. Keating, M.S.M. [illegible] Surgeon Lieutenant V. H. [illegible] to *Ajax*. Surgeon Lieutenant D. Bell [illegible] H.M. Naval Base [illegible]. Surgeon [illegible] Surgeon Lieutenant R. L. [illegible] M.B., to [illegible] Surgeon Lieutenant [illegible] W. Cards to [illegible] Surgeon Lieutenant H. [illegible] to Royal [illegible] Surgeon Lieutenant [illegible] M.B., [illegible] for Short Service [illegible] Chatham.

MAY

[illegible] to R.N. Barracks, [illegible] Surgeon Commander [illegible] R.N.V.R., [illegible] Surgeon [illegible] M.B., to [illegible] Surgeon [illegible] to R.N. Hospital, Haslar. [illegible] Surgeon Commander L. [illegible] Surgeon Commander J. M. [illegible] Surgeon Commander [illegible] Surgeon Commander C. R. [illegible] to R.N. Barracks, Devonport. [illegible] Surgeon Lieutenant Commander [illegible] Surgeon Lieutenant Commander W. [illegible] Surgeon Lieutenant Commander [illegible] Surgeon Lieutenant Commander R. A. Brown to R.N. [illegible] Surgeon Lieutenant Commander H. L. Douglas [illegible] A. Craig to R.N. Hospital [illegible] Surgeon Lieutenant Commander (D) [illegible] to R.N. Hospital, Malta. [illegible] M.B., [illegible] to R.N. Hospital, Plymouth. Surgeon [illegible] to R.N. Hospital, Chatham. Surgeon Lieutenant A. R. [illegible] Surgeon Lieutenant A. S. [illegible] Surgeon Lieutenant J. M. [illegible] M.B., [illegible] R.N. Hospital, Haslar.

JUNE

[illegible] R.N. Hospital, Malta (and for specialist duties). [illegible] (and for specialist duties). Surgeon [illegible] Medical Officer. Surgeon Commander [illegible] Surgeon Commander [illegible] M.B., to H.M. Naval Base, Port Edgar. [illegible] Surgeon Commander [illegible] to R.N. [illegible] W. C. [illegible] Surgeon [illegible] Surgeon Commander [illegible] M.B., to [illegible] Surgeon Lieutenant [illegible]

Commander (D) [illegible] to R.N. Hospital Haslar. Surgeon Lieutenant-Commander (D) H. M. Meek to *Excellent*. Surgeon Lieutenant-Commander (D) J. R. Palmer, O.B.E., to R.N. Hospital, Plymouth.

Surgeon Lieutenant [illegible] to R.M. Infirmary, Plymouth. Surgeon Lieutenant S. Morrow, M.B., to [illegible]. Surgeon Lieutenant W. J. Fleming to *Furious*. Surgeon Lieutenant J. F. H. [illegible] to *Benbow*. Surgeon Lieutenant W. H. Bradfield to *Hermes*. Surgeon Lieutenant [illegible], M.B., to *Emperor of India*. Surgeon Lieutenant E. H. Ramplog entered for Short Service. Surgeon Lieutenant R. A. Newbery entered for Short Service. Surgeon Lieutenant [illegible] J. Cusack, M.B., entered for Short Service. Surgeon Lieutenant (D) A. Lawrey to R.N. Barracks, Portsmouth.

RETIREMENTS

Surgeon Rear-Admiral H. J. Macleown, O.B.E., M.B., D.P.H., placed on retired list at own request, June 19, 1926.

Surgeon Rear-Admiral F. H. Nimmo, M.V.O., placed on retired list at own request, June 20, 1926.

Surgeon Captain R. F. Clark, D.P.H., placed on retired list (on account of age regulation), May 7, 1926, with rank of Surgeon Rear-Admiral.

Surgeon Commander A. H. S. Richardson placed on retired list (on account of age regulation), April 2, 1926, with rank of Surgeon Captain.

Surgeon Commander W. L. Grubbell placed on retired list (on account of age regulation), May 9, 1926, with rank of Surgeon Captain.

Surgeon Commander W. T. Haylor placed on retired list (on account of age regulation), May 27, 1926, with rank of Surgeon Captain.

Surgeon Lieutenant-Commander C. O'Bourne Rene, R.N.V.R., removed from list, April 28, 1926.

ROYAL NAVAL MEDICAL CLUB.

The Annual General Meeting and Dinner of the Royal Naval Medical Club was held at the Trocadero Restaurant on Thursday, April 22.

The Meeting was held at 7.30 p.m., Surgeon Rear-Admiral Sir P. W. Bassett-Smith, K.C.B., C.M.G., being in the Chair.

The Minutes of the previous year's General Meeting were read and confirmed. The Hon. Secretary then read the audited Balance Sheet and the Accounts, which showed that the Club was in a sound financial position, were passed.

The following officers were elected to serve on the Committee for the year 1926-1927:—

Retired List	Surgeon Rear-Admiral Sir P. W. Bassett-Smith, K.C.B., C.M.G.
	Surgeon Lieutenant W. Ibbotson
Active List	Surgeon Commander T. B. Shaw
	Surgeon Commander L. K. Bushe, O.B.E.
	Surgeon Commander F. Lewis Smith
	Surgeon Lieutenant-Commander (D) A. T. Dally
	Surgeon Commander J. McCutcheon, Hon. Secretary

Surgeon Commander J. L. Priest proposed and Surgeon Commander C. T. Baxter seconded a resolution that a circular be sent to all medical officers, Royal Navy, who are not members of the Club, setting forth its objects. This was carried.

Surgeon Commander F. Lewis Smith proposed and Surgeon Commander C. H. Buckeridge seconded a resolution that the proposal [illegible] at the General Meeting held in 1920 to the effect that when the financial position of the Club allowed a book containing the rules and a list of all members, together with a short statement setting forth the objects of the Royal Naval Medical Club, [illegible] be printed and circulated, be now carried out as soon as the finances of the Club appear to allow of this at present. This was carried.

A vote of thanks to the Chairman was carried unanimously.

Dinner was served at 8 o'clock, Surgeon Vice-Admiral Sir Joseph Chambers, K.C.B., C.M.G., occupying the Chair as President of the Club. The guests of the evening were the Admiralty [illegible] Sir Humphry D. Rolleston, Bt., K.C.B., Mr. Arthur [illegible], C.B., and Dr. [illegible] C.B.E. Unfortunately Sir Humphry Rolleston was unable to be present owing to ill-health.

After the Loyal Toast the President rose to propose the toast of "Our Guests." Before referring to those he said he wished to make a few remarks about the Club. The present financial position was most satisfactory, but he regretted that so few junior medical officers had [illegible] would do some propaganda [illegible] and the easy good [illegible] [illegible] been appliances [illegible]

[illegible] he volunteered the R.N.V.R. medical officers [illegible] during the war. He regretted the [illegible] to him in the morning [illegible] Mr. Edmunds [illegible] was the President [illegible] during the war. Dr. [illegible] Civil Consultants Board [illegible] nervous and mental disease [illegible] surgery was now divided among the [illegible] there were urologists [illegible] everything. The general [illegible] He was [illegible] to look for them [illegible] Royal Naval Medical Service [illegible] Sir Humphry Rolleston [illegible] pleased and proud to be [illegible]

[illegible]

[illegible] Surgeon Captain L. S. Miller [illegible] M. Morris [illegible] A. Clifford Morton, Surg[illegible] Brown [illegible] Howard Mummery, Surgeon L[illegible] W. C. Murray [illegible] T. W. Myles, C.B.E., Surgeon C[illegible] Surgeon [illegible] R. W. Nesbitt, Surgeon Comm[illegible] Surgeon Captain [illegible] P. H. Pearse [illegible] Surgeon Commander [illegible] Surgeon Commander J. F. [illegible] Surgeon Commander [illegible] [illegible]

NAVAL MEDICAL COMPASSIONATE FUND

[illegible] Quarterly Meeting of the Directors of the Fund held on April 23, eight cases [illegible] voted to the applicants. The following is a summary of th[illegible]

[illegible] of a Surgeon in the Royal Navy who died in 19[illegible]. [illegible] in poor circumstances. [illegible] Voted £35. [illegible] Naval Medical Compassionate Fund and Special awards [illegible]

[illegible] of a Deputy Inspector General in the Royal Navy [illegible] a year and the younger [illegible] nervous breakdown. Voted £20. [illegible] Naval Medical Compassionate Fund [illegible] awards [illegible]

[illegible] of a Deputy Inspector General [illegible] the Royal Navy [illegible] Voted £15. [illegible] Compassionate Fund and different awards £[illegible]

[illegible] of a Fleet Surgeon in the Royal Navy who died [illegible] Total amount received from the Naval Medical Compassionate Fund [illegible]

[illegible] Surgeon in the Royal Navy who died in 19[illegible] Voted £[illegible]. First application.

[illegible] Surgeon [illegible] Royal Navy [illegible] 187[illegible]. [illegible] Has outlived all her relatives and friends. Voted [illegible]

ROYAL NAVAL MEDICAL SOCIETY, MALTA

[illegible] meeting of medical officers at the Naval Hospital, Bighi, on October 2[illegible] [illegible] Admiral, Malta, presiding, it was decided to maintain the Naval Medical Society [illegible]

[illegible] to the officers of the R.A.M.C. and R.A.F. Medical Services [illegible] Malta [illegible] members.

[illegible] honorary members who [illegible]

[illegible]

[illegible] will [illegible] only find [illegible] of information, but will [illegible] officers from the [illegible] [illegible]

The following [illegible]

November [illegible] "Typhoid Fever with Special Reference to Recent Epidemics." Mess introduced by Surgeon Commander H. B. Parker and Surgeon Commander P. M. Rivaz.

December [illegible] "Pulmonary Tuberculosis with Special Reference to its Incidence on the Mediterranean Station." Surgeon Lieutenant Commander M. B. Moore.

January 12. "Some Visual Problems in the Navy." Surgeon Commander F. J. D. Twigg and Surgeon Commander W. W. Chilcott.

February 9. "Smallpox," by Professor A. V. Bernard, of the Public Health Department, Malta.

February 16. "Administration of Army Infectious Hospitals in War Time," by Colonel C. B. Evans, D.S.O., R.A.M.C.

(Signed) P. M. Rivaz, *Surgeon Commander, R.N.*
Hon. Secretary.

THE PARKES MEMORIAL PRIZE

The Parkes Memorial Prize, consisting of seventy-five guineas in money with a Gold Medal, is awarded every third year to the writer of the best essay on a subject connected with hygiene.

The competition is open to the Medical Officers of the Royal Navy, Army and Indian Army [illegible] Rank on full pay, with the exception of the Professors and Assistant Professors of the Royal Naval Medical School, Greenwich, and of the Royal Army Medical College, [illegible] their term of office.

The subject for the next Prize is the following: "The Means of Spread and Methods of Control of Bacillary Dysentery."

Essays to be sent in to the Secretary of the "Parkes Memorial Fund," R.A.M. College, Millbank, S.W.1, on or before December 31, 1928. Each Essay to have a Motto, and to be accompanied with a sealed envelope bearing the same Motto and containing the name of the Competitor.

The Committee reserve the right to withhold the Award should, in the opinion of the Assessors, no Essay attain a sufficiently high standard of merit.

By order of the Committee of the "Parkes Memorial Fund."

G. S. Parkinson, *Major, R.A.M.C.*
Hon. Secretary, Prize Committee.

April 26, 1926.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

The undermentioned ladies were entered as Nursing Sisters on the dates stated:—

Miss Isabel Helen Prime, April 8, 1926.
Miss Margaret Laverne Buckman, April 20, 1926.
Miss Nellie Sera Garner, June 1, 1926.
Miss Evelyn Jessie Lee, June 1, 1926.

APPOINTMENTS.

Nursing Sister Miss M. E. Campbell to Chatham Hospital; Nursing Sister Miss M. L. McNeil to South Queensferry Hospital; Nursing Sister Miss H. T. Fox Harvey to Malta Hospital; Nursing Sister Miss A. M. [illegible] to Haslar Hospital; Nursing Sister Miss I. H. [illegible] to Plymouth Hospital (to be on probation for six months); Nursing Sister Miss M. L. [illegible]kman to Plymouth Hospital (to be on probation for six months); Nursing Sister Miss [illegible] Garner to Haslar Hospital (to be on probation for six months); Nursing Sister Miss E. J. Lee to Haslar Hospital (to be on probation for six months).

RETIREMENTS.

Nursing Sister Miss Hilda H. Ramsbottom, invalided, dated April 14, 1926.

ADMIRALTY ORDERS

877.—Lieutenant A/S.—Medical Examination of Candidates.
(C.W. 3650/26.-3.1926.)

Candidates for Lieutenant A/S will not be finally accepted until they have been passed as medically fit by the Medical Officer of the Anti-Submarine School, Portland.

2. The existing arrangement of medical examination by the Medical Officer of the ship or establishment in which the candidate is serving is to continue, but this examination will be regarded as provisional only.

887.—Dental Stores—Method of Demanding

Mediterranean

(M.D.G. 2875.-26.9.1926.)

[illegible] H.M. Ships in the Mediterranean [illegible] through the R.N. Hospital, Malta [illegible] at the R.N. Hospital [illegible] instead of being despatched to the ship [illegible]

*881.—Dangerous Drugs Act, 1920

(N.L. 846.—1.4.1926.)

[illegible] issued in order to observe [illegible] laid down by the Regulations [illegible] possession and distribution of Morphine [illegible] salts, raw and medicinal [illegible] not less than one-fifth per cent. of Morphine [illegible] the Morphine to be calculated [illegible]

SECTION A

[illegible] Home [illegible] Hospital [illegible] Barracks at Portsmouth, Chatham and [illegible]

[illegible]

7. [illegible]

8. [illegible] Greenwich [illegible]

9. [illegible]

10. [illegible]

11. [illegible]

12. [illegible]

13. [illegible]

[illegible] The [illegible] the following [illegible]

[illegible] I & C

[illegible]

[illegible] relating req[illegible] than two year[illegible]

[illegible] Medical and Dental [illegible] by civilian [illegible] in full

SECTION B

Service Afloat

1 [illegible] Dangerous D[illegible] in any preparation [illegible] 0.2 per cent Cocaine [illegible] calculated as anhydrous Morphine) received [illegible] the Medical Officer of the Ship, and account [illegible]

2 The Medical Officer is to be responsible that adequate [illegible] the drugs, and the preparations containing them [illegible]

3 [illegible] to be kept on the form provided (M 177a) [illegible] all supplies [illegible] preparations in which the following particulars are to be stated

Date of Issue	Name of Patient	Rank or Rating	Ship	Name, quantity and strength of drug	Signature of M.O.

4 The record is to be divided into four sections devoted respectively to —

(a) Cocaine and Ecgonine
(b) Morphine
(c) Diamorphine
(d) Medicinal Opium

and substances containing these in the strengths shown in paragraph 1

Form M 177a must invariably be rendered and should be securely attached to form M 177 and accompany that form into office. The expenditure of dangerous drugs shown in these two forms must agree. In the event of the printed forms not being available manuscript forms are to be rendered.

5 These regulations do not prohibit a Medical Officer in an isolated position administering [illegible] of these drugs to himself for a proper medical purpose, but a record of such administration must be made on Form M 177a.

6 The attention of all ranks is particularly drawn to the fact that these drugs are supplied [illegible] strictly medical and dental needs only, and that severe disciplinary measures will follow if it appears that they are being issued for any other purpose or that anyone is attempting to obtain them without proper authority.

7 The regulations of the Dangerous Drugs Act (1920) apply to the following drugs and preparations in the Service Afloat Scale —

Chlorodyne (Tinct. Chloroformi et Morphinae B.P. 1898) containing 0.75 per cent. anhydrous Morphine.
Liquor Morphinae Hydrochlor. containing 0.75 per cent. anhydrous Morphine.
Solution of Morphine Sulphate (Hypodermic) containing 0.975 per cent. anhydrous Morphine.
Opii Pulvis (Tabellae) containing 10.00 per cent. anhydrous Morphine.
Pil. Saponis Co. containing 2.00 per cent. anhydrous Morphine.
Tinct. Opii containing 1.00 per cent. anhydrous Morphine.
Cocaine Hydrochlor.
Hypodermic Tabellae Cocaine Hydrochlor.
" " Cocaine Hydrochlor. et Adrenalin
" " Morphinae Sulphatis
" " Morphinae Sulph. et Atropin Sulph.
Ophthalmic Tabellae Cocaine Hydrochlor.

[illegible] ing [illegible] [illegible] 1920 —

Camph Co
[illegible] Cinis Aromat c Op (T[illegible]
Ipecac c Opio (Tab)
[illegible] Plumbi c Opio
[illegible] Cathartic c Opio

[illegible] preparations in the sheets issued to Gunboats Torpedo Boats, Torpedo [illegible] [illegible] are [illegible] affected by the Act

10 [illegible] H M Ships Royal Fleet Auxiliaries and Merchant Ships attached [illegible] Navy [illegible] [illegible] carrying a Medical Officer, the Officer in Command of the Ship [illegible] [illegible] to be [illegible] authorised to be in possession of these drugs so far as it is necessary to comply with the requirements of the Naval Service or of the Merchant Shipping Acts and [illegible] shall be lawful [illegible] subject to conditions prescribed by the Secretary of State to administer and supply the drugs to any member of the crew in accordance with instructions prepared and [illegible] for the Naval Service by the Board of Admiralty or in the Merchant Service by the Board of Trade

The keeping of a record of the use of these drugs in Ship's Log shall be [illegible] to be in compliance with the requirements of these regulations as to the keeping of records

11 Forms M 177 and M 177A containing records of the receipts and issue of these drugs shall be preserved for not less than two years from the date of the preparation of the last entry in the form as the case may be

12 It must be understood by Naval Medical and Dental Officers that [illegible] [illegible] of their own [illegible] prescriptions to be made up by civilian Pharmacists on shore the regulations made under the Dangerous Drugs Act apply in full

Note An issue of Forms M 177A M 236, M 237 and M 238 will be made to all concerned [illegible] [illegible] [illegible] are available from the R N Store Depot Royal Victoria Yard Deptford S E 8

(A F O s 2432/23 and 2374/24 are cancelled)

1192 —Special Service Seamen—Physical and Medical Standards

(N 1360 —16 4 1926)

The following physical and medical standards have been approved as a temporary measure [illegible] [illegible] for entry as Special Service Seamen —

Height 5 ft 3 in
Chest 34 in
Eyesight [illegible] each eye tested separately [illegible] sight to be capable of being corrected to normal by suitable glasses Colour vision must be normal

[illegible] —The standard of dental fitness as regards number &c of teeth is the same as for [illegible] other branches except that the absence of [illegible] opposing molars on one side of the [illegible] [illegible] should not be regarded as a cause for rejection of candidates who are in all other respects [illegible] provided the deficiency is unilateral and is compensated for by the presence of two [illegible] opposing molars on the other side

2 Other medical requirements are the same as for Continuous Service ratings

(A F O 816/25)

1360 —Anti-Gas Apparatus—Destruction of Respirators used by Officers and Men suffering from Pulmonary Tuberculosis

(C 0946/26 —21 5 1926)

When an officer or man is suspected to be suffering from pulmonary tuberculosis any anti-gas respirator which he may have worn in the a[illegible] period during which there was in the opinion of the Medical Officer any risk of infection, should be deposited with the Medical Officer and should not be used

If the patient does not [illegible] invalided, or if the diagnosis of pulmonary tuberculosis is confirmed in hospital the respirator should be destroyed

Notices.

[illegible] Medical Officers to send [illegible] Papers on [illegible] personal experience [illegible] Items of news [illegible] Naval Medical Service will be welcomed [illegible] on home and foreign [illegible]

[illegible] published in the JOURNAL OF THE [illegible] will become the property of the Journal [illegible] the author desires [illegible] sending the [illegible] copyright to himself

No[illegible] Deaths are inserted free of charge to subscribers

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Journal
of the
Royal Naval Medical Service.

Original Articles.

FOOD DEFICIENCY CONDITIONS IN RELATION TO PREVENTABLE ILLNESS.[1]

By Sir PERCY W. BASSETT-SMITH, F.R.C.P., D.T.M. and H.Camb.
Physician, Hospital for Diseases of the Chest, Victoria Park, E.

THE TROPICAL MEDICINE POINT OF VIEW.

It is often stated that the endemic population of tropical climates under natural conditions is free from dietary diseases so common in those living in temperate climates. This is only partially true, for in certain parts the struggle for existence is very severe and the food supply is so short—as, for instance, North-West Australia—that intestinal diseases from the consumption of unsatisfactory forms of food are very common. The same results are, I believe, found in parts of Africa, Borneo, &c., due to mutilation of the teeth. It is, however, certain that to maintain good health it is necessary for all races to supply and take the right kinds of food and that this shall not be deprived of important factors by the methods of cooking often employed. No doubt exercise and sanitation are very necessary, but it is the food absorbed that supplies the energy and strength required to carry out the duties of our early life.

Within recent years our knowledge of the important subject of dietetics has increased and widened, and a very large number of experiments, both human and animal, have been carried out. Quantities of books and pamphlets have been written on the subject, still the public often do not see these and they are slow at grasping the vast importance of a right dietary for their daily life and well being. It is a sad fact that much of

[1] A paper read in the Section of Public Health at the Annual Meeting of the British Medical Association, Nottingham, 1926, and reprinted from the *British Medical Journal* by permission.

[illegible] the most important [illegible] preservation. In [illegible] existence the [illegible] pronounced [illegible] easily obtainable in [illegible] form and [illegible] the poor appetite [illegible] the over worked man demands greater variety and [illegible] highly spiced [illegible]

It has been frequently shown that the old belief that so many calories of a mixed diet containing proteins, fats, carbohydrates [illegible] and sugar, with salts and water were sufficient for life is not the whole truth. To ensure life, growth and the maintenance of health the various so called vitamins or accessory food factors are necessary without these food consumed is but inert or dead for vitalizing the tissues of the body. This essential fact must be grasped first when making out any scale of dietary.

The following is a modern naval diet which does not include that bought [illegible] canteen with the extra 4d. a day:—

Present Naval Ration

	Proteins	Carbohydrates	Fat
Grammes	1[illegible]1·6	407·2	100·8
Calories	[illegible]	1,6[illegible]8·3	934·2
	Total number of calories	3,0[illegible]7	

Sugar is a most valuable article of diet in the tropics, especially for [illegible] hard labour. I have been much struck by the descriptions of the great value placed on, and craving for sugar by those climbing the [illegible] of the Andes in Peru. It is not only a great heat producer but [illegible] of proteins.

[illegible] it has thus undoubtedly a great determining action upon [illegible] physiological processes, for instance, under its influence the respirations are reduced in number, less oxygen is inspired, less carbon dioxide and water are given off by the lungs, and there is, therefore, a tendency to the retention of carbonic acid and alveolar air in people while at rest, also to the production, particularly in the rich, of glycosuria and acidosis. The urine is reduced in quantity from an average of 15,000 c.c. [illegible] 5,000 to 7,000 c.c. per diem. There is a reduction of chlorides and nitrogen excreted. The blood, as has been indicated, shows an increase of sugar content, and the Arneth count index is said to be pushed to the left.

The digestive powers are less vigorous than in cold climates, and large quantities of food cannot be well borne in the tropics. The food given should be such as to produce the minimum of heat, but giving sufficient nourishment. Proteins, in themselves, stimulate metabolism and also produce heat and naturally are physiologically less required; if, however, much physical labour is taken the requirements of a greater supply of protein is evident. Woodruff states that "all natives in the tropics are in a condition of partial nitrogen starvation and need much more nitrogen than they can get." To say that in the tropics we should live like the natives is quite wrong, and examples of certain enthusiastic but misguided, missionshould be quoted. He also states that the destructive effects of the unfiltered actinic tropical rays on protoplasm cause the necessity of more nitrogen than at home (which is a debatable question), and he thinks that it is untrue that fat is not needed in the tropics. It is evident that in arranging a dietary the conditions of work and the varying states of life must be taken into consideration.

There is no need for me here to describe the various forms of vitamins and their character, as this has already been done by other speakers. I give here a short synopsis of the tropical diseases due to deficiency in dietary:—

(1) Oriental beri-beri and infantile beri-beri.
(2) Occidental beri-beri.
(3) Ship beri-beri.
(4) Rand scurvy.
(5) True scurvy.
(6) Epidemic dropsy.
(7) Pellagra.
(8) Rickets.

In tropical climates the deficiency diseases mostly centre around the inadequate supply of vitamin B, hence it is the study of this factor which is the most important. The antineuritic factor was first found in the rice polishings and subsequently in varying amounts in many other substances, and all three vitamins are often found in the same substance—milk, eggs, green vegetables, tomatoes and yeast. The vitamin B has been obtained in a concentrated condition from rice polishings as "tiqui-tiqui," from yeast—"marmite," a palatable preparation of yeast—and other extracts, and vitamin C by condensing orange juice *in vacuo*, but all attempts to obtain a pure crystalline substance have so far failed. As constituents of our diet a great deal of attention has naturally been paid to their stability under conditions of cooking and storage of foodstuffs. Vitamin B is unchanged for a long time in dry storage and is fairly stable in ordinary cooking operations. It would appear that it is as essential to the normal life of a plant as to the animal which derives its whole supply from the vegetable world directly or indirectly, for no evidence of the synthesis of a vitamin in the animal world is known. Confirmation of this is found in the fact that yeasts and moulds require provision of the water-soluble vitamin B to start their growth; a small amount only is required and the plant will then continue to thrive by synthesizing its own supply.

According to Funk, vitamin B is essential for the formation of nucleic acid in the body. For this reason muscular activity or any condition of growth, by rapidly using up vitamin B, shortens the incubative period of the subsequent polyneuritis. Drummond notices that a diet deficient in vitamin B produced sterility in male rats, which is in accordance with the views generally held of the relationship between vitamin B and nuclear metabolism.

Th[illegible] important [illegible] in the tropics [illegible] which [illegible] great extent [illegible] of vitamin B [illegible] [illegible] has been [illegible] by the [illegible] investigations of Fraser Stanton and others in the Malay States [illegible] the almost exclusive use of white polished rice as the staple article of diet—that is rice which has been deprived of its outer layers and embryo in which the vitamin B is contained. By using coarse milled rice the disease could generally be prevented. It is not exactly known what it is that actually gives rise to the symptoms but a large amount of clinical facts have been brought forward to substantiate the views of Fraser and Stanton. It is not only adults that suffer, but there is an infantile form found in suckling infants of beri-beri mothers; this can be cured by giving extracts of rice polishings or by extracts of yeast. The same disease occurs in other countries where the staple diet is white bread or potato starch, and it was prevalent during the war among the troops in Mesopotamia, and in the eastern levies in the South of France. The diet that produces beri-beri in the few can hardly fail to have a deep-seated and bad physiological effect on the many: [illegible] everyday evidence of this is seen in native settlements in the East. When we consider the extent to which the European in the tropics has [illegible] to exist on canned foods and milk and a relative absence of fresh [illegible] vegetables it seems not unlikely that some at least of the evils [illegible]bed to the climate may be really due to the food.

With regard to beri-beri which is usually classed as a true deficiency disease, it must be pointed out that the Japanese still hold the view that the polyneuritis of birds, due to the ingestion of polished rice in which the deficiency of vitamin B is the cause is different from true beri-beri. This view is supported by Megaw in a recent paper who places epidemic dropsy as a form of beri-beri, similar to ship beri-beri. His view is that in the present state of our knowledge it is unsafe to assume that a deficiency of vitamin B is the cause of beri-beri but that it is a disease due to some change probably bacterial in the rice, which occurs on faulty storage—a toxin being formed which may be the essential cause of some forms of beri-beri and possibly of the disease in general. There is another theory, held by Vedder that polyneuritis and dry beri-beri are chiefly due to a deficiency of vitamin B in the diet, and wet beri-beri and epidemic dropsy and perhaps ship beri-beri to a distinct and as yet unknown factor.

From a naval point of view the beneficent action of eating "scurvy grass" was recognized by Captain Cook but it was due to Dr Lind and Sir Gilbert Blane that the great preventives, lemon and lime juice, were supplied and regularly issued as an antiscurvy ration for the ships' companies when at sea. From that time to this lime juice has been constantly used but its efficacy has disappeared. The reason for this has been ably shown by Mrs Alice Henderson Smith. As originally prepared, the lime juice was made from sweet limes *Citrus medica* and with lemons imported chiefly from Spain. In 1793 war stopped these supplies, but in

1802 del[illegible] which had obt[illegible] hold, w[illegible] nated [illegible] 180 by the [illegible] of the cultivat[illegible] West In[illegible] large [illegible] made available [illegible] the Navy caused the sou[illegible] var *acida*, to supersede the sweet limes and lemons formerly in use, and for a time this new lime juice was believed to be better than the old. This has been proved not to be the case, both by results of Arctic expeditions under Sir George Nares and by much recent laboratory experiment work.

I find that in 1793 Dr Johan Kramer of Nuremberg, in the *Medicina castrensis* said that it was useless to attempt to cure scurvy by drugs or by rubbing in applications to the affected joints but recourse should be made to the acid vegetables of the garden, or if these could not be obtained lemons. The juice from the vegetables should be added as a watery solution to milk or lemonade be made. These will bring about a certain cure.

There is no time here to enter into a full description of modern work on the action and characters of these essential vitamins except to point out that one of the most important practical factors is their keeping power. The antineuritic is fairly stable—very stable if we are to believe the work of Jansen who found that paddy of over one hundred years old kept in storehouses in the higher regions of Java was still as rich or almost as rich, in anti beri beri vitamin as fresh rice. The anti-scorbutic factor is on the other hand very much less stable being easily destroyed by cooking oxygenation and keeping especially in the presence of alkalis.

Though the anti scurvy vitamin is generally so quickly destroyed by heating there is the important exception in the case of tinned tomatoes; these, as originally shown by Hess are still powerfully anti scorbutic and are useful both for prevention and cure.

We know now that symptoms due to lack of vitamins are very slowly evolved, causing indefinite signs of ill health and malnutrition, though in the tropics there is generally no deficiency of either the anti scurvy vitamin C or the anti rachitic vitamin A yet in temperate climates these early symptoms are frequent in young children and are often not recognized. It is, therefore, good practice to reinforce the ordinary foods so often deprived of these three important vitamins. The food given should produce the minimum of heat but give sufficient nourishment. Proteins are physiologically less required and we should follow out the example of the people of the country, who take more vegetable foods. If Europeans will insist on living as in a cold climate they develop all sorts of intestinal troubles and quickly run down.

It may be generally accepted that we need food from animal sources for the growth and maintenance of our body tissues; we need carbohydrates and fats for our body heat and energy, with inorganic salts to build up our tissues and perform physical functions; and lastly, we need an adequate supply [illegible] healthy [illegible] the [illegible] excess of the physiological requirements there is a tendency to gout and intestinal disorders, with an increased amount of work for the kidneys in eliminating the nitrogenous waste. An excess of fat tends to retard digestion of other foods; an excess of starch and sugar causes fermentation with headaches and some forms of intestinal auto-intoxications and even a form of diabetes. People may appear well for a long period on a diet deficient in vitamins, but they will inevitably develop some form of constitutional disease, slowly evolved.

There seems to be little doubt that the water-soluble B, the water-soluble C and the fat-soluble A vitamins have a definite place in a chain of reactions, which if wanting terminate in producing conditions known as beri-beri, scurvy, and rickets. Pellagra is also probably due to a deficiency of some protein factors.

THE CEREBRO-SPINAL FLUID: OBSERVATIONS ON ITS ORIGIN, DESTINATION AND FUNCTION

By Surgeon Commander WILLIAM J. GERRARD, M.D., M.R.C.P., D.P.H., R.N.

Cet enfant a de l'eau dans la tête, dit le vulgaire; cet enfant est hydrocéphale, dit [illegible] le médecin, répétant littéralement par un mot grec ce que dit l'ignorant dans [illegible] langue. Mais quelle est cette eau? D'où vient-elle? [illegible] dont les [illegible] ment d'y s'occuper.—Magendie.

Introductory

In Royal Naval Hospitals the operation of lumbar puncture has become a routine procedure in medical and surgical practice, but few medical [illegible] show any real knowledge of the origin, destination and function of the cerebro-spinal fluid. Of the earliest writers Galen, Vesalius and Valsalva noted the presence of a watery fluid inside the skull. Cotugno in 1764 and Haller in 1766 wrote on the clear limpid fluid in the ventricles of the brain, and in the space between the meninges and convolutions. In 1825 Magendie discovered the close connection between the fluid in the ventricles and that in the subarachnoid space. In 1891 Quincke first performed the operation of lumbar puncture in the living subject, and [illegible] study, particularly by the French school, led to the discovery [illegible] pathological changes in the cerebro-spinal fluid brought about by [illegible] morbid conditions affecting the central nervous system.

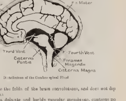
Anatomical Considerations

[illegible] references must be made to the anatomical relationships of the [illegible] which contain the cerebro-spinal fluid, and also to the histological [illegible] of the structure lining the cavities. The cerebro-spinal fluid occupies the ventricles of the brain the subarachnoid space, and the central canal of the spinal cord

The Subarachnoid Space

The brain is covered by three membranes, the dura mater, the arachnoid mater, and pia mater Between these three membranes are two cavities, the subdural cavity between the dura and [illegible] and the subarachnoid between the arachnoid and the pia Both walls of the subdural space are covered by endothelium The space is more potential than real and contains a minute quantity of a lymph like fluid Between the subdural and subarachnoid spaces there is no communication of any kind There appears to be a complete and impenetrable barrier between the two

The arachnoid mater, a thin, non-vascular membrane both sides of which are covered by a layer of endothelial cells forms an impermeable partition between the subdural and the subarachnoid spaces It does not



Distribution of the Cerebro spinal Fluid

adapt itself closely to the folds of the brain convolutions, and does not dip down into the fissures

The pia mater, a delicate and highly vascular membrane, contains no capillaries an important point in considering the absorption of the cerebro-spinal fluid It adapts itself very closely to every fold and fissure of the brain The subarachnoid space, intervening between the arachnoid and pia mater, is in places very narrow, but in others of considerable depth There are three places where the depth is marked and these are named cisterns The cisterna magna lies between the posterior surface of the medulla and the cerebellum and is formed by the arachnoid bridging across the interval between the medulla and cerebellum The cisterna pontis [illegible] medulla and is continuous round it with the cisterna magna [illegible] lla with its many vital centres is thus protected by a water cushion [illegible] sterna basalis, formed by the arachnoid stretching between the [illegible] poles, is of large size

It will the[illegible] that inside the cranial cavity the cerebro spinal fluid resembl[illegible] f water forming a few deep lakes with communicating [illegible] a mass of fluid not stagnant, but in a state of constant [illegible]

Between the [illegible] pass very numerous fine septa which divide the space [illegible] freely communicating These partitions are also lined with endoth[illegible]

The Arachnoid Villi

These structures are found most typically as finger like projections of the arachnoid penetrating into the lumen of the superior longitudinal sinus Where a vein enters the sinus it carries with it a sleeve like prolongation of the arachnoid The villus has an external covering of endothelial cells Each villus is composed of fine web-like interlacing strands, having the same appearance as the spongy tissue in the subarachnoid space Near the sinus the loose spongy tissue gives place to a myxomatous material Each villus having passed through the dura projects freely into the sinus as do the chorionic villi into the blood sinuses of the pregnant uterus The arachnoid villus therefore is an extension of the subarachnoid space into the cerebral sinuses In the spinal canal there are no blood sinuses and no spinal arachnoid villi

Mott and Weed have both described other prolongations of the subarachnoid space, namely the perivascular spaces not visible in the normal brain These are formed by the fine sleeve like sheath which accompanies the cerebral vessels as they pass into the brain substance

In these perivascular spaces is a fine trabecular structure like that in the subarachnoid space, and they are directly continuous with the subarachnoid space

Around the nerve cells are perineuronal spaces which communicate directly with the perivascular spaces, and thus with the subarachnoid space The important point is that the nerve-cells are thus bathed in cerebro spinal fluid In the case of the olfactory optic and auditory nerves there are prolongations of the subarachnoid space so called perineural sheaths In the spinal canal the arachnoid sac reaches the first piece of the sacrum

The Ventricles of the Brain

The ventricles of the brain communicate freely with one another The lateral ventricles communicate by the foramina of Munro with the third ventricle which opens by the aqueduct of Sylvius into the fourth ventricle In the roof of the fourth ventricle there is the central foramen of Magendie and two lateral openings Thus there is a free communication between the fluid in the fourth ventricle and that in the subarachnoid space around the medulla and cerebellum

A layer of cubical epithelial cells, the ependyma, lines the ventricles. In each ventricle the choroid plexuses lie free as two convoluted vascular tufts. They are covered by an epithelial lining and resemble somewhat the tufts of Bowman in the kidney. Just as in the case of the kidney these cells are differentiated for a special function. They closely resemble the cells lining the alveoli of a secreting gland. After the administration of ether distinct changes similar to those seen in a secreting gland can be observed in the epithelial cells covering the choroid plexus. Mott considered that the choroid plexus should be spoken of as the choroid gland.

Origin of the Cerebrospinal Fluid

Endless discussion has taken place on this question. Now it is recognized that there is probably more than one source.

Has the fluid in the ventricles and the subarachnoid space a common origin? On the clinical side the study of internal hydrocephalus shows that there is usually some obstruction to the outlets in the roof of the fourth ventricle. The fluid, which causes enormous distension, is produced within the cavities of the ventricles.

Dandy and Blackfan experimentally blocked the aqueduct of Sylvius leading from the third ventricle, and produced a condition of internal hydrocephalus. Weed passed a cannula through the Sylvian aqueduct and withdrew fluid from the ventricles thus entirely eliminating the surrounding tissues. Therefore the fluid was produced by either the choroid plexus or the ependyma lining the ventricle.

In 1902 Petit and Girard made extensive investigations and proved that hypersecretory substances such as ether and pilocarpine produced changes in the epithelial cells covering the plexus and increased the amount of the fluid. Mott confirmed these observations. Cushing made direct observations upon the choroid plexus in cases where a porencephalic cavity communicated with the ventricles. He observed droplets of fluid exuding from the surface of the choroid plexus. In one case he ligatured the vessels entering the plexus and the secretion ceased. Dandy blocked the foramen of Monro on one side of a dog's brain and on the other side he removed the choroid plexus of the lateral ventricle leaving the ependyma intact. He then blocked the foramen of Monro on that side. In the former case a condition of unilateral hydrocephalus developed. In the latter case the ventricle became shrunken and collapsed. It contained no fluid although it was still lined by the ependyma.

The extraventricular does differ from the intraventricular fluid, and that suggests some other mechanism for its production in addition to that of the ventricles. Dandy and Blackfan gave convincing proof of this in a case of internal hydrocephalus where there was complete obstruction to the ventricular [illegible] By lumbar puncture only [illegible] metres of fluid could be [illegible] but in a very short time [illegible] similar quantity was removed [illegible] fluid could not have come from the ventricles and therefore must [illegible] from some extra [illegible]

What is the [illegible] of the fluid It must be either the endothelium of the walls of the subarachnoid space or the perivascular prolongations described By using subarachnoid injections of potassium ferrocyanide Weed was able to show that granules reached the furthest recesses of the perivascular spaces, but did not enter the vessels Therefore the fluid appears to flow from the vessels into the spaces and there is a constant addition to the subarachnoid fluid from the perivascular spaces These carry with them the products of neuronal metabolism

Cerebro spinal fluid is being continually secreted The fluid can be replaced four or five times over in twenty four hours In man the total quantity is about 120 cubic centimetres The continuous secretion is sometimes seen in cases of fracture of the skull base

Absorption of the Cerebro-spinal Fluid

Under normal conditions how is the fluid absorbed? Most of the fluid passes into the blood Leonard Hill and Lewandowsky proved this, but the problem of how the fluid gained access to the cerebral veins remained Weed by a very careful technique used ante-mortem subarachnoid injections of potassium ferrocyanide, and hardened the brain *in situ* in fluid containing 1 per cent hydrochloric acid It was conclusively proved that the arachnoid villi, already described, were of the greatest importance as a mechanism for the passage of the cerebro spinal fluid from the subarachnoid space into the venous circulation Mott, on the other hand, suggested that the absorption occurred into the capillaries of the brain There was no support for this view

What occurs in the spinal canal where there are no arachnoid villi and no venous sinuses, as in the cranium? It has been shown experimentally that the fluid can be absorbed into the lymphatic system by means of the subarachnoid tubular prolongations along many cranial and spinal nerves

Circulation of the Fluid

This is of interest from the therapeutic point of view One can think of the cerebro spinal fluid as divided into two parts the part above the tentorium cerebelli and the part below that membrane

Experiments have proved that substances do not pass easily from the lower to the upper part Fluid from the ventricles escapes via the foramina in the roof of the fourth ventricle into the subarachnoid space in the subtentorial region Fluids injected below the tentorium reach the cerebral cortex with great difficulty On the other hand fluids injected above the tentorium reach every part of the cerebral cortex It appears that in the upp[illegible] the flow of fluid is mostly from above downwards. Kram[illegible] suggested that there may be an ascending current in the central canal of the cord.

Brief [illegible] must be made to factors influencing the flow of cerebro spinal fluid. Dixon and Halliburton have shown that some substances do act as cerebral lymphagogues, for example choroid plexus and brain tissue extract, also intravenous injections of fluid from cases of general paralysis and cerebral disintegration. They suggested that the brain substance may produce a hormone which carried to the choroid plexus stimulates the epithelial cells. Other specific stimulating factors are excess of carbon dioxide in the blood, and it is interesting that the cerebro-spinal fluid is one of the means of producing a rapid excretion of carbon dioxide when the blood contains excess.

Substances can pass from the cerebro spinal fluid into the veins, but extremely few can pass from the blood into the fluid. This is owing to the action of the epithelium of the choroid plexus. It forms an impenetrable barrier, and thus protects the delicate nervous structures from toxins which are excluded. The specific agglutinin of typhoid fever is absent. Neither intravenous injections of crystalline substances nor of dyes reach the cerebro-spinal fluid. On the other hand, alcohol chloroform acetone and urotropine can be recovered from the cerebro spinal fluid. Many substances can pass with ease in the opposite direction, namely from the fluid to the blood. Absorption is rapid and large amounts of normal saline can be run into the subcerebellar cisterna of a dog and be absorbed in a short time, a litre in one to two hours. The rate of production and the rate of absorption influence cerebro-spinal pressure.

Function of the Cerebro spinal Fluid

One function of the cerebro spinal fluid is to act in a mechanical way. It may be compared to a water jacket which supports and protects the central nervous system. It ebbs and flows in response to the demands of changing volume of blood in the cerebral vessels. If one considers the composition of the cerebro spinal fluid it becomes obvious that it has other functions. It contains sugar for purposes of metabolism. There is a high carbon dioxide content. Everything points to the cerebro-spinal fluid being closely concerned with the metabolism of the nervous tissue. Trotter in his second Victor Horsley Memorial Lecture refers to the great flow of fluid seen sometimes as the result of accident and supposes that the function of the large flow of fluid is to flush through the subarachnoid space and dilute the products of cerebral metabolism so that the resulting fluid becomes non toxic and can be safely admitted into the blood stream. The fluid plays an important part in protecting the nervous tissue from the action of harmful substances circulating in the blood. This is partly owing to its peculiar composition and to the selective action of the choroid plexus. The most importa[illegible] that [illegible] with nutrition of and elimination of waste p[illegible] the [illegible] of the central nervous system That is why [illegible] is so high The sugar provides energy f[illegible] the nerve cells and fibres The albumin although [illegible] provides nourishment for these structures The cere[illegible] the part of the lymph of the brain

Acco[illegible] the cerebro spinal fluid is an "elective filtration th[illegible] dialysation through a membrane which has the power of holding [illegible] all substances except those necessary for the nerve t[illegible] compares the fluid to the aqueous humour of the eye and the endolymph [illegible] internal ear These belong to a class which may be termed [illegible] Under normal circumstances the process of the production of [illegible] spinal fluid is probably one of filtration but when the choroid ple[illegible] stimulated to activity the process becomes one of active secretion [illegible] talks of the cerebro spinal fluid as being a dilute secretion poured out by the choroid plexuses His views on the cerebro spinal fluid are of particular interest

This article has been written for the benefit of those who have no access to works on a subject which is all important The question of cistern puncture has not been raised as it is not a routine operation in naval hospitals

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REPUTATIONS OF PHYSICAL EXERCISES AND TESTS

By Surgeon Captain H. B. HILL, M.B., B.S., M.R.C.S., L.R.C.P.

Exercises are often adopted in systems of physical training on reputation alone and without any investigation being made as to their reliability. This reputation is usually an attractive one to the lay mind, but often it is quite erroneous. Deflective and calming exercises are a case in point.

Deflective, Depleting, or Calming Exercises

These had an attractive reputation to the uninitiated, but their claims were unfounded. The physiology of these exercises will be found in my paper, entitled "The Physiology of some Medical Exercises used in Physical Drill," published in this Journal, January 1926, and, by Admiralty permission, reprinted in several gymnastic papers outside.

Physical training is used to improve the normal functions and reflexes of the body, and not to interfere with them, and any procedure or method which seeks to interfere with a function or reflex is a medical procedure, especially when it involves an attempt to alter heart beats and the rate of respiration. An exercise introduced with the avowed intention of interfering with a normal function or reflex is most certainly a "medical" exercise, and should not be used outside a hospital.

If a system of training is correct then such exercises are not needed, but if a system needs such medical remedies as artificial control of heart and respiration it should be abandoned. All these exercises have been abandoned in the Royal Navy.

The introduction of semi-medical exercises into a system of drill for Service men carries with it an atmosphere in which vim is diminished. Instructors with ideas in their subconscious minds of calming the heart, deflecting the blood, straightening spines and tampering with respiration, are automatically apt to fail in pursuing their duties with the vigour that is necessary. The whole system under these conditions is apt to become one of treating the body rather than training it.

The instructor may tend to pay more attention to the solemnity of a leg or breathing exercise than to the drill itself. The men also by being constantly reminded of their hearts and circulation, &c., are apt to think too much of them, and under stress and strain it follows that they may very easily imagine themselves to be ill. If an instructor (about to make a class do a deflective exercise) instead of giving the order in the usual way lowers his voice and intones it, the whole thing is apt to be impressive, but the story he tells is untrue. It is an abracadabra.

Vital Capacity and Exercises Designed to Enlarge the Thorax by Force (Span bend, &c.)

Here again vital capacity by itself has a reputation amongst physical trainers which is quite unmerited, if other factors are not taken into con [illegible] Increased [illegible] capacity does not mean improve[illegible] [illegible] [illegible] power of endurance or resistance [illegible] A good [illegible] the co-ordination of the heart and [illegible] runs which cause natural and [illegible] unconsciously to adjust his circulation [illegible] activity

The [illegible] vital capacity for everyone [1] Each person has his own and [illegible] only be found approximately There are fairly constant [illegible] between the vital capacity of the lungs and certain other [illegible] the body, such as sitting height, standing height chest [illegible] and body surface area [2] Dreyer [3] shows that definite relationships between the weight of the body the length of the trunk (sitting height) and the chest circumference do exist and demonstrates the uniformity of this relationship to the vital capacity of the lungs Dreyer's tables give the normal vital capacity for each person based on these weights and measurements [4]

Other observers use the surface area of the body and weight or standing height [5] To obtain the surface area of the body, Boothby and Sandiford have made a chart from which the surface area of the body can be read off when weight and standing height are known no mathematical calculations being necessary [6]

Each person has his own vital capacity which must be ascertained [illegible] and other things being equal, a healthy person who is fit has [illegible] a larger vital capacity for his body than another equally healthy [illegible] who is unfit from want of exercise [3] Vital capacity of 15 per cent below the normal standard *for that person* should be looked upon with [illegible] and disease searched for [5]

[illegible] normal vital capacity as above, the question of age is of little [illegible] since up to 45 or 50 years when it begins to diminish [3] Fat people have diminished capacities Vital capacity in the recumbent position is [illegible] per cent less than the standing Race and nationality definitely affect it Sex does too so much so that there are separate standards for the male and female [1] The time of the actual examination in relation to the last meal affects it, and so does occupation Strain, over-fatigue, exhaustion and neurasthenia all reduce vital capacity and for these reasons because a man has a normal vital capacity before taking exercise it does not follow if he is unfit that he will have a normal one after the exercise This is often overlooked

The best method of increasing a defective vital capacity is by exercise in the open air Dreyer believes that individuals who spend considerable time in the open air playing games &c increase their normal vital capacities regardless of their occupations [4]

Forcibly opening out the chest by special artificial exercises tends to over stretching of the lungs and pleura, especially if attempts are made to enlarge the chest by opening up and raising the ribs by putting the back-

[illegible] and applying direct force and leverage to it for [illegible] the dorsal curve. The [illegible] method [illegible] In spite of a big chest measurement a man may have a small vital capacity. However good a vital capacity may be, it is obvious that it is of no use at all unless the heart through the circulation is able to convey the oxygen to the tissues. This is a practical point often omitted. Therefore all tests done for vital capacity are of little value unless the reaction of the heart to the different states of respiration is tested at the same time.

The tests to which the heart may be put in conjunction with vital capacity are the usual ones of testing the heart's reaction to effort. These consist roughly of taking the normal pulse first in different positions and then comparing it with a pulse during and after various grades of effort, from walking up a few steps to running up many, or a cross-country run, &c. At the same time the reaction of the pulse to various states of respiration should be observed. Amongst others take the time that the breath can be held after one full expiration and one full inspiration; at the same time carefully count and note the pulse.

The expiratory force of the chest should be noted by taking the height to which a subject can force a column of mercury. Also after one full expiration and inspiration note the length of time a subject with the breath held can support a column of mercury at 40 mm., the pulse meanwhile being counted every five seconds. The pulse should remain steady.

These last three tests are carried out in the Royal Air Force. Blood pressure is also investigated.

Vital capacity is dependent on many factors, and a chest measurement or a vital capacity by itself gives very little information. The above tests should prove very useful in recruiting examinations as they would help to detect weak and damaged heart muscle in very early stages, and probably diminish the amount of invaliding in the first few years of service from myocarditis, &c.

Spanning Group

In the general notes of the Physical and Recreational School Circular Letter of December 14, 1925, the dangers of grasping bars and doing a span bend were referred to.

When a span bend is done it is claimed that it develops a freely movable and resilient chest cage and an erect carriage of the body, by flattening out the dorsal curve. If at the same time it is believed that, as the dorsal spine is straightened the ribs are separated and their ends elevated (as is sometimes taught) and the breast bone pushed further from the spine (thereby enlarging the chest to "make room for more air"), then there seems to be no limit to the ferocity with which these exercises will be applied, even to the extent of the exercise mentioned in paragraph 383 on p. 123 of vol. i of the R.N. Handbook of Physical and Recreational

Training" This is a truly ferocious exercise, and admittedly dangerous even in the text of that book (p 124) In this exercise the middle of the dorsal curve of the spine is placed on a fulcrum and the whole weight of the body is used as the force to bend the spine straight. What has not been noticed about the exercise is that the same force has a greater tendency to increase the lumbar curve during its performance This is very well shown in the diagram on p 123 of vol i

There are other exercises of a similar nature where the spine is placed across a fulcrum and direct force, leverage or weight is applied to the spine to straighten out the dorsal curve, procedures which are dangerous The same serious objections apply to exercises of the forward hanging type

Even if a span bend could increase the size of the chest it can be seen from the section above that a big chest measurement or a big vital capacity is of no value unless other things are taken into consideration In fact, it may be harmful for the stretching of the pleura and displacement of the contents of the thorax may cause "drag" and produce symptoms, among which may be an irritable heart.

A dorsal curve bullied flat leads to alterations in the other curves of the spine lordosis and pouter pigeon chest For the curves of the spine have a normal relation to one another and if one alone is altered the others must alter in sympathy During the position of span bend itself the chest is rigidly compressed from before backwards respiration checked and the circulation of the body impeded, and therefore there is nothing in this position which will produce a freely movable and resilient chest

Altering the curves of the spine deliberately is no part of a system of physical training A good position of the head and a correct carriage of the body should be the limitations of the physical training instructor's ideal If he cannot produce that by ordinary drill and free exercises, then a medical officer should be consulted Those who suffer from symptoms due to an abnormal curve of the spine need special medical treatment Blunderbuss treatment applied to the masses in attempts to give everyone a perfectly rod-like spine is not advisable Excess of zeal in this direction, especially by non medical instructors, leads to exaggerations in descriptions and diagrams, even to the extent of showing a spine as straight as a ramrod and devoid of every vestige of curve These exaggerations lead to exaggerated exercises

The span bend is, from the evidence of vol i "R N Handbook of Physical and Recreational Training" dangerous in the hands of the ordinary teacher It is impossible to apply it to a large class for the mistakes that can be made in the position are so numerous that the odds are largely against anyone ever getting it according to the position in the book A correct position would necessitate an instructor for each pupil If an instructor has more than one pupil the positions must be faulty, and held too long, even if the span bend, when done accurately according to the [illegible] It is [illegible] position and [illegible] fu those [illegible] th and muscul[illegible]

As [illegible] which it will alway[illegible] It is [illegible] for the common weal to attempt to alter the shape of any part of the body by force and leverage, especially by a method which is admittedly dangerous. A spine should have all its natural curves in correct proportion to one another. In a flat back the curves of the hollows of the spine are filled up by muscle; if an X-ray is taken the natural curves of the spine are seen.

Some say that they can get the position of span bend better in their pupils when the wall bars are grasped. As the position is a bad one it is better for the wall bars not to be used. The other exercises in the handbook under the heading of "The Spanning Group" can be used as dorsal exercises. In these free exercises no unnatural leverage can be used.

In the span bend with the wall bars gripped, or with a fulcrum in the middle of the dorsal curve, an attempt is made to straighten out the dorsal spine (which is likely to cause an increase in the lumbar curve) and also the aim is to spread eagle the ribs, which causes a pouter pigeon chest, both being done with the idea of getting a bigger ebb and flow of air into the lungs. This is done without any heed being paid as to what the heart may do.

Unless the oxygen is extracted from this tidal air and at the same time can be sent by the heart through the circulation to the tissues and the CO extracted, large volumes of air passing in and out of the lungs are of no more use to the body than large volumes of air passing over the naked skin, or in and out of a pair of bellows. A point to remember is that the body is so made that this limited capacity of the blood to carry oxygen is partially met by the ability of the body to form what is usually referred to as an "oxygen debt." [7] The heart must work hand in hand and must be trained with the respiratory apparatus, and this is best brought about by graduated runs, and not by attempting to widen the distance between the breast-bone and the spine by unnatural and forcible leverage, leaving the heart to look after itself. A resilient chest cage is best brought about by normal deep breathing as takes place during and after normal exercise, and if it is wished to improve the carriage of the body, natural movements of the spine and attention to the position of head and body are quite enough for physical training purposes.

To enlarge the thorax artificially to make room for more air, disregarding the process of carrying the oxygen to the tissues by the heart and circulation, and also disregarding the normal vital capacity and tidal air, is on a par with enlarging the abdomen to make room for more food, disregarding the process of digestion, the normal capacity of the abdomen of that person.

[illegible] The [illegible] [illegible] [illegible] [illegible] is true that this method would [illegible] [illegible] [illegible] is the attempt to enlarge the chest [illegible] [illegible] [illegible]tions neither the extra food nor the extra oxygen can be [illegible] by the body. In the [illegible] too respiration will not be deeper than necessary for the needs of the body.

With a normal lung and alimentary canal the key of the situation lies in the amount of food and oxygen the blood can carry to the tissues regardless of the volume of air in the lungs or mass of food in the alimentary canal. An increased cubic capacity of the chest does not mean that the breathing would be deeper or that more oxygen would be carried by the blood to the tissues. The body cannot be forced to absorb more food or oxygen than it requires by making room for more air in the chest or more room for food in the abdomen, and when it comes to stress and strain the amount of oxygen absorbed by the body is limited by the capability of the heart and circulation to carry it.

There is another simple fact which is forgotten. A bigger movement of the chest can be obtained by natural deep breathing than by any other methods, span bends or otherwise. These only cramp the chest. If the chest is deficient, deep breathing is the best way to bring it to normal, but the arms must be kept still. A man training for a race does not try to enlarge artificially the capacity of his chest. Neither does he try to lengthen his legs, but he trains his heart, respiration, muscles and glands to work together by means of graduated runs.

It may be asked why under these conditions any chest exercises should be done beyond deep breathing. Certain exercises remain in vol. i, R.N. Handbook of Physical and Recreational Training, which are not harmful and which have reasons for their retention.

Every individual has a normal appetite and a normal vital capacity. No one attempts to interfere with the former, yet the latter is subjected to a daily interference in physical training. The root of the trouble is, I think, due to the fact that three or four times a day every one in the world sees what a normal appetite is like, and the standard becomes fixed in the mind, and no attempt is made to increase the entry of the food into the body by enlarging the abdomen. On the other hand no one sees the normal amount of air breathed in and out of the lungs, therefore there is no fixed or normal standard in the public mind, and everyone tries to enlarge the chest.

These exercises are mainly designed for this one purpose of enlarging the chest, but no one would think of applying the same methods to the abdomen to increase the quantity of food swallowed. The artificial enlargement of the thorax is just as unreasonable. If the vital capacity is deficient and no lesion can be found, the best treatment is out of door exercise and graduated runs, which cause natural and deep breathing, which is the natural movement of the thorax and lungs.

[illegible] Manual in Physiology [illegible]
"A [illegible] is capable of supplying [illegible] with oxygen sufficient for their needs If the need for oxygen in the tissues exceeds the supply it is in every case the heart at fault and not the respiration It is the failure of the heart and circulation to [illegible] oxygen that stops exercise It is never due to a lack of oxygen entering the lungs in normal circumstances

On p 76 of the first edition of the Descent of Man Darwin says As the progenitors of man became more and more erect with their arms and hands more and more modified for prehension and other purposes with their feet and legs at the same time transformed for firm support and progression endless other changes in structure would have become necessary The pelvis would have to be broadened, the spine peculiarly curved and the head fixed in an altered position all of which changes have been attained by man

Professor Lindhard on p 91 of Information from the University Laboratory of Theoretical Gymnastics 1924, No 2 issued by the Copenhagen Gymnastic Society, says that the span bend is a complicated exercise which has none of the excellent properties ascribed to it and ought never to be used in the training of children It is easier to say what one does not obtain than what one does One does not get a straightening of the spine on the contrary in nearly every case there is an increase in the lumbar curve There is no expansion of the chest it is strongly compressed in a forward, backward direction, and there is a marked interference with respiration In addition the circulation is impeded and the posture unnatural Lordosis and pouter pigeon chest are a result of such struggles to alter the normal curves of the spine by force

A military training should be simple above all things free from any exercises likely to be injurious, and consist of exercises which can be applied to any body of men anywhere without the necessity of *special* supervision against the occurrence of bodily dangers and without the necessity of *special* apparatus, beyond what can be easily supplied

These notes together with others of mine published in medical and gymnastic papers give the reasons for the deletion of chapters on 'Breathing' and the 'Span Bend' in vol i 'R N Handbook of Physical and Recreational Training

Breathing Exercises

Breathing exercises done with moving arms have also had an unmerited reputation The effect of arm movements on the respiration is explained in my paper mentioned above [3] The respiratory muscles and apparatus have been exercised day and night since birth and well know how to breathe They have had constant practice Breathing is entirely self adjusted and requires nothing more than to be saved from interference and overstrain No artificial exercises or system of breathing can possibly

[illegible]

[illegible]

[illegible] M[illegible]ar Move[illegible]

[illegible] positions which have to be held [illegible] Exercising one muscle [illegible] the body still is of no value for the [illegible] The enlargement of a single [illegible] the [illegible] dumb-bell exercise, is of very little [illegible]

[illegible] of use when done for a [illegible] the muscles of the legs done by [illegible] the movements must be those [illegible] Other examples of movements of isolated muscular groups [illegible] with the body still are those done for medical purposes or for purposes of discipline [illegible] The movements done for [illegible] purposes should be clearly distinguished from those used for physical training, although they may be done in the same table of exercises.

The great drawback [illegible] isolated muscle-group movements with the body [illegible] is that there is no means of telling how much ginger a man is putting [illegible] them. He may move his arms [illegible] and his head or bend his back [illegible] is little force or energy in [illegible] If his body is moving about [illegible] something. By isolated muscular movements the [illegible] nothing and even if the daily performance of these movements [illegible] in the size of the muscles as soon as the exercise is [illegible] this group of muscles rapidly reverts to the normal muscular [illegible] of the body.

[illegible] in which all groups of muscles take part simultaneously and [illegible] the body is moving about, are of great value. For in this case the [illegible] groups of muscles learn to work harmoniously together acting [illegible] with the right force and in their proper sequence. In [illegible] they learn to act in co-ordination and clumsiness is dispelled [illegible] learns to control efficiently the complicated muscular move[illegible] essential to our existence. This control leads to a still [illegible] namely balance of the body. Whether we are [illegible] playing golf, tennis or any other game, success depends [illegible] the power we have over our balance. A good balance of the [illegible] of the muscle groups should be the aim of physical training.

[illegible] physical jerks the exercises are usually presented in [illegible] introducing in [illegible] grotesque positions which appeal to the uninitiated These exercises will develop muscles to some extent but as soon as they are left off the muscles return to the normal standard of the body They do not develop the qualities necessary for the better performance of the habitual muscular movements of every-day life They contain no movements requiring complicated muscular co ordination and there are none that aim at the acquirement of skill and dexterity For a man who wishes to gain excellence in games these exercises are not only useless but harmful For they make him muscularly self-conscious and break up that fine co ordination so necessary for accurate movement of the whole body [10]

" When muscles are greatly over developed they become parasites on the vitality which is sapped to provide their nourishment [11]

Physical jerks are exercises of effort and such exercises do not cultivate constitutional vigour to the same extent as those of endurance [12 (such as walking or running or games)

The method used in the Navy at present is a combination of movements useful for the purpose of discipline, and the production of a smart appearance in a body of men together with exercises useful for physical training and the production of endurance Games boxing and fencing are also important parts of the scheme

Some people who cannot walk or run may be thrown back on to unnatural movements to get their exercise Movements of isolated groups of muscles may then be useful as they do stimulate the heart circulation and skin, but not to the same extent as a walk or a run

Measurements

It will be seen from the above that tape measurements alone are of little or no value Increased measurements of this sort mean nothing as regards any result of physical training proving neither endurance nor well being They may even be due to fat Measurements in boys as a criterion of the results of physical training prove nothing Boys will grow in spite of physical training and to prove that physical training had anything to do with their development, it would be necessary first to find out how much of their development was due to natural growth, and how much due to physical training Gymnasts forget that there is another side to the question, i e that retardation of growth may take place due to excessive artificial exercises or to artificial exercises wrongly applied

The faults of the tape measure are well known shrinkage and becoming twisted during measurement A man used to being measured can push his muscles out and increase a measurement especially the chest (latissimus dorsi) A man rarely gets a measurement the same on two measurements being done immediately after one another in the same place The usual

[illegible]

[illegible] The [illegible]

[illegible] elaborate system of [illegible] is in the R. N. Handbook of Physical and Recreational Training, vol. I, which in some cases needs the personal attention of a highly trained instructor to each pupil, was applied to the Navy, where instructors have classes of twenty to forty men or boys to instruct. It very soon became evident that many exercises could not be applied afloat.

On going through the handbook it is obvious to anyone that it would be extremely difficult, apart from the expense, to supply sufficient instructors and medical officers to guard a class of pupils from the dangers mentioned in the handbook alone.[1] The same applies universally. It is [illegible] necessary that each school should have a system which is specially [illegible] for that school.

Innumerable things have to be taken into consideration: amount of [illegible] played, type of boy or girl, quality of food, age of pupils, type of [illegible] ground used for physical training, only to mention a few. To apply the same system in a hard and fast manner to schools which differ [illegible] will lead to failure. Each school should have the special advice of an expert as to what its physical training should be.

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(12) *Idem. Ibid.*
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[illegible] ADVANCES IN GENERAL ANÆSTHESIA

[illegible] W. H. EDGAR, M.D. [illegible]

[illegible] has not yet been invented [illegible] that [illegible] being made and that [illegible] advances [illegible] this [illegible] consummation [illegible] time [illegible] are performed but up to the present extended trial of them seems only to have further established the position of ether as the best anæsthetic for general purposes. Acetylene has not been found to be completely satisfactory, while ethylene, which is much used abroad for certain operations, appears to offer no advantage over the combination of nitrous oxide and oxygen in the hands of experts, and has the serious disadvantage that it is highly inflammable and explosive.

The ideal anæsthetic should have the following attributes:—

(1) It should be safe.
(2) It should be efficient for the surgeon's requirements.
(3) It should have no bad after-effects.

Conditions 1 and 2 are well fulfilled by ether, especially when given by the perhalation or, as it is more often though not so correctly called, the "open" method. It is usual nowadays to deliver the ether to the patient in the form of a vapour derived by bubbling either oxygen or ordinary air through liquid ether and so maintaining a steady concentration which is seldom to be obtained by the "drop" method.

It has been said that the problem of ether is the problem of induction. Ether is really a weak anæsthetic, and to produce insensibility it requires to be present in a concentration of from 11 to 18 per cent. in the inspired air as against the 2 to 3 per cent. in the case of chloroform. But this necessary strength of ether is irritating to the respiratory passages and unpleasant to the still conscious patient, so that it is usual to induce anæsthesia by gas, C_2H_5, or chloroform (in order of preference) before passing on to the administration of ether itself.

It is of great importance that a hypodermic injection of morphine $\frac{1}{6}$ gr. and atropine $\frac{1}{100}$ should be given about half an hour before the operation, though in the case of patients under the age of 20 the morphine is better omitted.

Another detail making for an easy anæsthesia is to use an airway consisting of a curved rubber tube which slides over the tongue and assures the patency of the upper respiratory passages. It should be inserted as soon as the patient is "under."

When these precautions are taken ether is almost an ideal anæsthetic as far as conditions 1 and 2 are concerned, but it certainly falls short of fulfilling condition 3, for it is followed by nausea and vomiting in a certain proportion of cases even when given expertly. It is in the improvement of this aspect of anæsthesia by ether that advances have recently been made.

[illegible] H appear [illegible] by indulging [illegible] excessive breathing, can produce a period of apnœa, towards the end of which he may become actually cyanosed through lack of oxygen before the CO_2 concentration becomes high enough to actuate the respiratory centre to renewed activity (Ross).

Acting on Haldane's discovery Y. Henderson of Yale University has investigated the uses of carbon dioxide for the purposes of controlling the respiration in anæsthesia. If a patient is made to breathe CO_2 in excess, his respirations are found to become much deeper and his respiratory exchange is greatly increased in volume and thus becomes capable of carrying into his lungs a much greater quantity of anæsthetic in a given time than if he were breathing naturally. In experiments along these lines it has been found possible to induce anæsthesia with ether in under two minutes, and conversely when the operation is finished and the ether stopped, the patient can be made to breathe so deeply by CO_2 that he quickly ventilates out of his system the ether he has absorbed. Thus a rapid return to consciousness results and the incidence of bad after effects, which are only due to the slow excretion of ether, is very greatly minimized.

The induction of ether anæsthesia by means of CO_2 calls for some special apparatus and, after all, is no very great gain except perhaps in time, but the de-etherization of the patient by this method is quite simple and very desirable.

I use a cylinder of compressed gas in which the proportion of CO_2 is 20 per cent. and oxygen 80 per cent. From this cylinder a rubber tube is used to deliver the gas to the patient. The free end of the tube is first dipped under water and the valve so adjusted that a constant, but not fussy, stream of bubbles results. Then, when the stitches are being inserted, the ether is turned off, and the CO_2 tube is led under the "open" mask, or sometimes directly into the airway tube without any mask at all. The respirations are soon noticed to increase in depth though not in rate. With each breath the patient de-etherizes himself very much more effectively than if left to his own devices. It must be understood that the patient does not get such a high percentage of CO_2 as 20 per cent., because he is drawing from the ordinary air as well, whether the mixture is given under a mask or through an airway. He probably only receives about 5 per cent. The addition of the oxygen merely assures us that there is no danger of starving the patient of oxygen.

Though I have used this method in a considerable number of cases I do not suggest that it is necessary in every case as a routine, but only when the length of the operation renders after effects likely or its nature makes vomiting undesirable.

That the procedure is effective was proved to me by the very first case on which I tried it. A Sick Berth P.O., who was about to have his third operation for sequestration of the femur following a fracture told me that he did not mind going under but that the smell and taste of ether, on coming to, made him feel really ill for twenty four hours.

I de-etherized him without his knowledge and next morning he volunteered the statement "It was grand this time, sir. I never tasted a thing." He had it on a subsequent occasion at his own request and with equally happy result.

The uses of carbon dioxide as a respiratory stimulant is by no means confined to anæsthesias. It has already been found to be of use in asphyxia neonatorum and in other forms of respiratory failure. It probably has a large field of utility in connection with the treatment of poisoning by non-respirable gases such as carbon monoxide.

But whatever further uses are found for this gas which at one time was blamed as the principal cause of respiratory vitiation, there is no doubt that it has provided us with a means of getting nearer to the ideal anæsthetic by assisting us to fulfil conditions as far as the administration of ether is concerned.

A PROPOSED ANTI-VENEREAL PROPHYLACTIC

By Surgeon Commander J. L. PRESTON, M.B., F.R.C.I., D.P.H., R.N.

AND

ROBERT C. FREDERICK, Esq.

The first anti-venereal prophylactic issued in the Royal Navy contained an organic silver salt as its active principle; this was later supplemented by the issue of a calomel cream. The idea was that the former would destroy gonococci and the latter *Spirochæta pallidum*. The use of the silver preparation was abandoned some years ago and at present the calomel cream alone is issued. Details of the composition of this preparation and a general discussion of the question have been given in a previous communication (Preston, *Jour. Roy. Nav. Med. Ser.*, 1923, ix, pp. 24-30). The efficacy of the calomel cream has been suspect for some time and the present research was undertaken in an endeavour to obtain a prophylactic which would be equally efficacious against gonorrhœa and syphilis.

Nearly all anti-venereal prophylactics used and proposed for use have the inherent defect that they have a fatty or oily base which is quite immiscible with watery fluids. A satisfactory preparation should contain a non-irritating substance of high germicidal power incorporated in a base free from the objection referred to above. The evolution of such a preparation had already occupied our attention without arriving at a satis-

[illegible] which [illegible] the work of Surgeon Commander G. Bodle[illegible] R.N. Hospital, Chatham, who suggested the use of a preparation of the following composition :—

Thymol	0·[illegible]
Tragacanth	1
Glycerine	10
Water ad	100

The thymol is powdered very finely and then mixed with the tragacanth. The glycerine is then added and finally the water. Surgeon Commander [illegible] found that this preparation did not cause discomfort, that it yielded [illegible] satisfactory results in treatment of gonococcal urethritis, and that it [illegible] spirochaeticidal action.

A [illegible] of this preparation was forwarded to the Medical School at [illegible] for examination. We found that the thymol showed a marked [illegible] to crystallize out and the comparatively large crystals formed [illegible] likely to cause burns if they lodged within the urethra. By using [illegible] in place of thymol and adjusting the quantity (after analysis [illegible] give the stipulated amount of thymol we were able to overcome this disadvantage. Both the original and the modified preparations [illegible] a co-efficient of about $\frac{1}{25}$ carbolic acid. Unfortunately on investigating the irritant properties by personal test, it was found that they could only [illegible] tolerated in the urethra for a short time. The discrepancy in regard to the findings at Chatham and Greenwich may be explained, perhaps, by the [illegible] that at the former establishment the subjects of the tests were [illegible] treatment for venereal disease and this treatment had reduced the [illegible] sensitiveness of the urethra.

It was considered that the attainment of a sufficiently high germicidal [illegible] in a prophylactic, with the active principle diluted to an extent to [illegible] irritation, would most likely succeed by the employment of mercury compounds, and it was with these that most of our further work was carried out. Only the more salient features require mention. The carbolic coefficients of three such compounds, examined in accordance with the standard test for disinfectants in the Navy, are shown below :—

Mercuric iodide (dissolved in potassium iodide) between	1 100	and 1 500
Mercuric oxycyanide (aqueous solution)	10	170
Mercuric cyanide (aqueous solution)	90	110

The very high coefficient of the mercuric iodide indicated this as being the compound most likely to provide the active ingredient required, but subsequent investigation led to its abandonment owing to the extremely high dilution necessary to overcome its intensely irritating properties. It [illegible] at least thirty times more irritating than the cyanide compounds and the advantage of its high carbolic coefficient is nullified. A solution of potassium iodide alone did not cause any irritation. A strength of $\frac{1}{750}$ of either of the cyanides causes little or no discomfort when applied to the urethra, but the [illegible] the jelly [illegible] approximate [illegible] power of the cyanide [illegible] principle finally adopted [illegible] mercury oxycyanide.

In regard to the base, the tragacanth jelly did not seem to be entirely satisfactory but one which appeared to fulfil all requirements was found by making a jelly with starch and glycerine

The final formula, and the method of compounding it, is detailed below —

Mercury oxycyanide		1/750
Starch		1/12.5
Glycerine		1 10
Water	to complete	

To prepare about 1 *lb* —The mercury oxycyanide is ground very fine and a stock solution of this is prepared by dissolving 6.6 grm in water and making to 1 litre. Forty grammes of potato starch is weighed into a large mortar and ground up with 40 c.c. of water. Two hundred and seventy cubic centimetres of water and 50 c.c. of glycerine are just brought to the boil, then 100 c.c. of the mercury oxycyanide solution is added to this and the whole again brought to the boil. This boiling solution is then added, a small quantity at a time, with constant grinding, to the starch suspension in the mortar. The partially formed jelly is then transferred to a flask fitted with a cork and a narrow glass tube (to prevent loss by evaporation) and heated over a water bath for one hour. The jelly is allowed to become cold.

A jelly prepared according to these directions was found to have a coefficient greater than 1 in 3 carbolic acid. It will probably be necessary to put it up in non metallic tubes. Objection might be taken to the use of mercury oxycyanide on the ground that it is a poison scheduled under the Pharmacy Acts. In practice there would be no danger of poisoning as an amount of mercury oxycyanide greater than that contained in a prophylactic tube of average size can be taken by the mouth and is recommended as a daily pill in the treatment of syphilis (P J, ii 09, 426, quoted in "Extra Pharmacopoeia," Martindale and Westcott, sixteenth edition, p. 409). In point of fact the contents of a tube of calomel cream, which contains about 10 gr. of calomel, would probably give rise to much more unpleasant results if taken internally.

Editorial

[illegible] announce a change in the editorship of the [illegible] Fortunately [illegible] changes are not frequent, and in the present [illegible] Surgeon Rear-Admiral Bond relinquishes his post after six and a [illegible] of unremitting work in the interests of the Journal. He [illegible] holds the record in length of tenure of office and whilst editor [illegible] ended two steps on the ladder of promotion.

His knowledge of English and other languages, and his keen eye for typographical errors, have produced in his co-editors a sense of security which they alone can appreciate. He has never been so busy with his other onerous duties that he could not find time to straighten out some knotty point of editorship, and there must have been many evenings when instead of enjoying a well-earned week-end rest he has burned the midnight oil striving to make some particularly tangled manuscript intelligible to the printer. In this again only his co-editors know the time and patience he has expended on the Journal. In wishing him every happiness and success in his future career we feel sure we have the support of all our readers.

With his departure the present editors feel a sense of loneliness, fully exposed to the bitter wind of criticism. They can only do their best to maintain the high standard which the Journal has reached. No Journal, however, can flourish and no editor can fulfil his duties unless they receive a large measure of support. We appeal to our readers to bring the Journal to the notice of all medical officers who do not yet subscribe. We appeal to those medical officers who are about to terminate their service not at the same time to withdraw their support. We appeal to all medical officers to contribute original articles, clinical notes and descriptions of any interesting occurrences they may encounter. They that go down to the sea in ships do have tales to tell: why should they not follow the injunction of the Psalmist by declaring these wonders for the children of men?

It must be remembered that the Journal is not only instructive to those who read it: it is even more instructive to those who write for it. There is no method of clarifying the mind on a subject which will compare with a serious attempt to write out a connected account of the matter

a paper [illegible]
when the subj[illegible]
personal observations and opinions [illegible]
always necessary to ascertain and [illegible] have [illegible]
been put forward on the same subject [illegible] pen in hand [illegible]
writer sits down and collects his thoughts [illegible] realizes how little he
really knows. This realization is most salutary [illegible] the intending
writer to read up his subject.

The Journal is not a trading concern and we live [illegible] our income.
The quality of its pages must depend upon the support it receives. We
have every confidence that, having made our appeal, we shall receive
sufficient support to make disfiguring economies unnecessary. We [illegible]
doing our best. Will you do the same?

Naval Medical History of the War

HISTORY OF THE MEDICAL UNIT OF THE ROYAL NAVAL DIVISION FROM ITS INCEPTION TO THE EVACUATION OF GALLIPOLI

By Surgeon Rear Admiral ARTHUR GASKELL, C.B., O.B.E., F.R.C.S., D.P.H.
Late A.D.M.S. of th Royal Naval Division

(Continued from p. 227)

On August 9 Major Sparkes, the A.D.M.S. of the 11th Division, sent a message to Stanford that the enemy appeared to be bringing up reinforcements to Anafarta Sagir, and that our troops were about to occupy all the high ground before the enemy had arrived, the 10th Division attacking on the left, the 11th Division on the right. He added further details of the attack to be launched by the 11th Division at 5 a.m. Acting upon this Stanford strengthened Mayne's bearer post on Chocolate Hill with Sparrow and "C" section of bearers and at the same time ordered Foxell with "B" section of bearers to form another advanced bearer post in rear of the South Staffords. In the course of the forenoon the following message arrived from Foxell:—

"11.5 a.m., August 9, 1915.—I am intending to form an advanced bearer post at once about 91—F—1 in an old trench. There are a very fair number of wounded still to be brought in from the South Staffords. Can you possibly arrange for a relay of bearers to come up to my post? Cookson will act as guide. I want to clear the Staffords as rapidly as possible, as their regimental aid post is small and unsafe. Will the relays please bring at least a dozen stretchers? Six squads will be sufficient."

Stanford at once sent up "B" tent subdivision to act as bearers and applied to the A.D.M.S. for more stretchers and bearers. The A.D.M.S., however, could not help. Although the plan had been for the 34th Field Ambulance to work with the Sherwood Foresters, the wounded of this battalion fell to the lot of our already overworked bearers. Foxell's messages bore eloquent testimony to the "uncomfortable" state of affairs, and later in the afternoon, when some of the Sherwoods made a hasty retreat, the bearer post had to be withdrawn to "somewhere about 101—Y—7."

In the meanwhile Stanford was dealing with a large number of wounded in his main dressing station and experiencing considerable difficulty in clearing them from the beach, as all boats were busy landing troops.

From the foregoing it is seen that Foxell had a busy time; so also had the other medical officers.

The following field message [illegible] of the state [illegible] Sparrow —

"3 5 p m August 9 1915 — Will [illegible] up all stret[illegible] all stretcher bearers of 'C' section [illegible] at main [illegible] also any who may be at the midway [illegible] connection with South Staffords [illegible] Border Regiment They have had [illegible] them

Mayne also applied for more dressings [illegible] men, who by that time had become [illegible] In fact all th[illegible] officers realized that their men required a [illegible] Stanford to that effect Stanford in turn applied to the A D M S [illegible] with all the best intentions in the world could [illegible] the men

During August 10 and 11 the pressure of work in bringing in the casualties of the action of August 9 continued Bostock arrived just in time on August 11 with a large quantity of medical stores and two marquees, the latter being of inestimable value as shelters for the wounded from the great heat of the day and the coldness of the nights

A lull in the fighting took place till August 19 and during this lull the troops consolidated their positions, and Stanford received various orders involving slight changes of his area of operations and consequent movements of advanced dressing stations and bearer posts In all these changes Burdett showed excellent leadership His zeal and ability in the organization of the work of the field ambulance are noted in many of Stanford's reports

On August 19 action took place on the right sector without success Reserves immediately went up under heavy shrapnel fire Over two hundred casualties—most of the wounds being of a serious character, as if from explosive or reversed bullets—came through our dressing station, and owing to shortage of boats we had as many as one hundred wounded on the beach at one time awaiting embarkation and again messages passed asking for more bearers more boats more wagons, &c

During August 20 fresh medical dispositions had to be made in preparation for a big action about to take place on the morrow Stanford, the A D M S and the O C 14th Casualty Clearing Station held a conference and decided as follows —

Stanford's field ambulance instead of being attached to certain troops now adopted the usual practice of being told off to operate a certain area, viz, the sector from base of Chocolate Hill to Susak Kai Yu through the centre of which sector a track led back with a relay bearer post just off it at advanced end and an advanced bearer post further in the rear the route being marked with small Red Cross flags

At 10 a m, on August 21 two bearer subdivisions with medical officers arrived from the 34th Field Ambulance with orders to place themselves at [illegible] Stanford [illegible] had previously arrived [illegible] from the bearer post [illegible] to the casualty clearing [illegible] beach. Stanford [illegible] these extra bearers to work [illegible] with [illegible]. The tent subdivisions also worked [illegible] and took part in the work of evacuation, some towing [illegible] dressing station to the 11th Casualty Clearing [illegible] working with the wagons between the bearer post and the [illegible].

[illegible] at 2.30 p.m. with a heavy bombardment from the [illegible] followed half an hour later by the advance. The [illegible] at [illegible] p.m. and from then onwards a continual [illegible] found their work extremely heavy over [illegible] subdivisions had to work by candle light, no [illegible] available. The wounds being largely the [illegible] very severe and entailed many emergency opera- [illegible] serum. The attached rough sketch [illegible] positions of the R.N.D. bearer posts.

A" Represents advanced bearer [illegible] post R.N.D. [illegible]

[illegible] Represent reserves. The [illegible]

[illegible]

On August 22 evacuation of wounded continued. The [illegible] lighting of the dressing station caused work to be slowed during the night and some con- [illegible] had occurred, but by 10 a.m. all again worked smoothly. During [illegible] afternoon Fawell was wounded. Although the [illegible] for Stanford's [illegible] had been clearly defined, urgent requests arrived for him to [illegible] wounded from sectors supposed to be [illegible] by the Army [illegible]. The following is a sample of these orders:—

"Officer 32nd Brigade reports that there are many wounded, both [illegible] and men, in front of 11th Division. These men will die if not [illegible] night We can [illegible] is being relieved and [illegible] to take over another line to [illegible] must be delayed

Stanford sent out bearers under an officer at 10 p m and collected fifteen wounded from the area, including one medical officer suffering from nervous breakdown For the next few days a period of comparative quiet followed during which anti-cholera inoculations formed part of the work of the field ambulance

Late in the afternoon of August 27 the A D M S ordered Stanford to move his field ambulance to "A" beach in the left sectional area a distance of about five miles, and sent him ten mule carts for the purpose He completed this movement shortly after midnight but as he had received no definite orders as to his exact destination he unloaded his stores on the hillside, and the men took the little available cover and awaited daylight Stanford's field ambulance had, during the period from first landing up to this move from "B" beach on August 27 dealt with 1 701 casualties

About mid day of August 28 the A D M S arrived and indicated the position he had chosen for Stanford's camp The men at once started digging in, but superior orders arrived two hours later to clear out of the reserve area[1] The A D M S then gave him a site in a gully on the side of the hill above "A" beach in his own area, to which he moved by 5 p m, and again dug in the moving up of the stores being completed during the next week

On September 1 Stanford lent one of his medical officers to the 57th Field Ambulance to relieve Lieutenant McCullagh who had been sent to hospital Stanford found the ground at his new camp extremely insanitary but with his usual thoroughness and cheerful optimism he cleared things up and made his men as comfortable as possible in spite of many difficulties

On September 1 Stanford reported as follows —

"The 33rd Field Ambulance receives the sick and has a bearer post near D H Q The 35th Field Ambulance which is below us on the hill apparently receives the overflow of sick from the 33rd Field Ambulance the 34th Field Ambulance (which has no stores and very few officers) has a bearer post about a mile away from us towards the trenches We work in reliefs with them at the advanced bearer post

On September 6 Lieutenant Colonel Shanahan arrived and took over the duties of A D M S of the 11th Division Shortly after his arrival he gave Stanford instructions to dig into the side of his nullah so as to enlarge his dressing station to accommodate a hundred sick and wounded Thenceonwards Stanford had very little to do except treat the sick many of his own officers and men, including Foxell Mayne and Gow going down with severe dysenteric symptoms

On September 17 Surgeon Calthrop arrived with water duty men for the Anson battalion This officer having had experience as in actual

X

[illegible] concerning the [illegible] which a [illegible] words [illegible] for [illegible] ambulance [illegible] forty each with a [illegible] loaded with the last party, [illegible] many [illegible] his Army colleagues He

reported himself to the A D M S of the Royal Naval Division on September 30 The following is Calthrop's report —

To A D M S R N D,

Divisional Headquarters

As directed, I proceeded with the R N Medical Unit details for the [illegible] battalion to Suvla Bay at 11 a m on Friday, September 17

The trawler called at Anzac Cove and we were piloted through nets [illegible] changed [illegible] 1 p.m. [illegible] [illegible] the [illegible] [illegible]

Suvla Bay [illegible] and had [illegible] [illegible] a [illegible] netting scheme and the picket boat [illegible] at D, marked on the map

This spot is very rocky and the channel [illegible] very narrow difficult and buoyed there are two other [illegible] of D alongside the signalling station at the point and [illegible] The latter is reserved as far as I could judge for the [illegible] wounded and the former for the disembarkation of [illegible]

The wounded I saw leave the beach [illegible] pro tected oil engine barges or beetles as the [illegible] first used in the Suvla landing The beach was [illegible] shell [illegible] and was densely packed with transport and mules

Anson headquarters is marked at E and the 2nd Field [illegible] site at F rest camps are situate along the coast at G

The details were handed over to the *Anson*, and next [illegible] I started off from the 2nd Field Ambulance and walked by the Salt [illegible] the comma shaped Chocolate Hill The bed of the lake [illegible] dry in fact the western shore was crusted with salt The [illegible] area between the salt lake and the ranges of hills inland is very flat and covered with low scrub, easily circumvented except toward the [illegible] end of the northern range—Kizlar Dagh—where the scrub is bushy and dense and the ground rocky

At the foot of Chocolate Hill where adequate and good water is found was a battery of 16-pounders which had replaced a mountain battery

A communication trench cut in hard, gravelly stony ground runs over the hill almost due south and leads *via* reserve trenches to the support and firing line lying in the valley between Chocolate Hill and the W hills A most excellent view was obtained from the summit of Chocolate Hill and two or three lines of Turkish trenches, interspersed with barbed wire were made out at bombing range in some places from our firing line

There was a very obvious concavity in our line here between the Chocolate Hill and the Sari Bair convolutions and it struck me that when the Salt Lake is full actual territorial gain here is small, and that communication with this point might be difficult especially as the corresponding beach is under heavy fire

I then retraced my steps skirting Chocolate Hill and walked northward along the lines overlooking the valley between the Chocolate and W hills the latter being a prospected immediate objective I was told Here the same description applies, increasing lines of Turkish trenches being obvious the country here is delightful, long grass and oak trees

Towards the northern side of the squarish disposition of our trenches and as one mounts the slopes of Kizlar Dagh, the ground becomes stony and barb... our firing line here can be seen for miles with the naked eye partly [illegible] owing to the whitish nature of the upturned soil, aided by the remarkable straightness of the line running as it does at right angles to Kizlar Dagh, which range is parallel to the shore.

Opposed to our trenches here is a maze of Turkish lines, the firing lines being separated however for about 800 yards except for a few of our saps springing out. A long communication trench leads from the Turkish lines towards Ejelmer Bay, which bay is largely made use of by warships for the purpose of bombardment, there being present in Suvla when I was there, *Swiftsure*, *Prince George* and *Talbot*.

Our communication trench here leads over Kizlar Dagh and along the shore back to Cape Suvla *via* the rest camps. At one place—Jephson's Post—along the line I noticed a strong machine gun redoubt manned by the R.N.A.S.

The landing at Suvla was, I gathered, effected at A, C and B as they are still called, the 2nd Field Ambulance landing at C. All that is used now, except for one or two isolated hospitals, is the northern and southern slopes of Lala Baba and the similar slopes of Cape Suvla, as before detailed, the remainder having been evacuated on account of shell fire.

Observed batteries in the Suvla area are marked thus IIII, and the number of guns indicated.

There seems no doubt whatever that the high range east of the W hills was taken, and thus with Kizlar Dagh the northern and eastern sides of the desired square obtained as an immediate result of the landing, but that they with the W hills had to be abandoned on account of lack of tenacity as some insinuated, or of the failure of sufficient reserves to come up on an extended front, as seems the prevalent opinion.

Next morning I took the trawler to Anzac and walked along the beach to the N.Z.H.Q., situated on the northern side of Ari Burnu. The beach was occasionally shrapnelled and is in the process of having a small railroad system laid down.

From Ari Burnu to where Walker's Ridge reaches the sea, one is obliged, except at night, to travel *via* a broad mule sap, as this area is heavily sniped from a distant but overlooking ridge not yet captured. The despatch riders, however, love to cover this exposed area at the gallop, and it seems to be one of the cherished events of the day to watch this occasional episode.

I then walked along the extreme left of our actual Sari Bair position held by the N.Z., Gurkha and East Anglian Brigades, until the trenches passed the day before were encountered.

The country, I think, might be called exceedingly difficult, small hills, ridges and bluffs existing, covered with unyielding scrub, in some cases the trenches being situated on very sheer ground. The captured Turkish trenches on Bauchop's Hill are very interesting, chiefly zig-zag, the upthrown soil being decked with scrub now turning an autumnal brown. Several machine gun pits were seen, concealed by a framework of brush [illegible] [illegible] [illegible]

There [illegible] summit of 971 but owing to the [illegible] the mistake of a guide the Gurkhas [illegible]

The Turkish trenches on the slope [illegible] are heavily and repeatedly shelled [illegible] by destroyers [illegible] as heavy howitzers dug into the sand [illegible] Suvla

During these two days that I was at Anzac there seemed to be [illegible] of Turkish ammunition Taubes [illegible] with the [illegible] and the balloon shed were bombed and [illegible] of [illegible]

Next day I walked along the coast [illegible] extended [illegible] ably toward Gaba Tepe returned and walked up [illegible] Monash Valley The valley is still sniped and a broad sap has been cut starting at a point opposite the first limb of the valley (up which the 1st H Q [illegible] Marine Brigade was situated) and extending up towards Pope's Hill I was surprised to find that little progress had been made here [illegible] ground had been taken in front of the original Quinn's and [illegible] Posts and Deadman's Ridge is still no man's ridge Progress has [illegible] ever been made in difficult country in the inland [illegible] corresponding to the extended beach running towards Gaba Tepe

I think one might say that the position seemed [illegible] and snug enough and certainly Monash Valley was a [illegible] of well dug in stores and camps Progress here would seem very difficult

The original A and N Z Brigade has been relieved and one battalion of the rejuvenated 29th is also being rested at a time off the Peninsula

Dysentery seems very prevalent and water scarce The Australians speak highly of the courage and fairness of the Turks many cases of the succouring of our wounded having occurred

The new A and N Z reinforcements are considered even better than the original troops the Maoris especially being highly spoken of

The return journey to Helles was made on the following Tuesday afternoon

(Signed) E S Calthrop

Pink Farm Temporary Surgeon R N

September 25 1915

We now must revert to the history of the main body of the R N D medical unit at the end of the Peninsula during August and September while Stanford and his field ambulance took part in the Suvla fighting

The engagement of August 7 8 and 9 timed to coincide with the Suvla landing and carried out by 29th and 42nd Divisions proved costly and failed to result in the capture of the ground intended, though it possibly achieved the purpose of drawing a large number of Turks away from Suvla

As before stated our medical unit took over most of the work of evacuating the wounded our officers and men [illegible] conspicuous for their efficiency and bravery When the whole [illegible] had been completed our men returned to our division [illegible] and grateful messages being received subsequently from the A D M S [illegible] 29th and the A D M S of the 42nd Division During [illegible] one of our bearers Private R Holden was killed and another Private H [illegible] was wounded

It is gratifying to record that Lieut Colonel Humphreys the P M O of the casualty clearing station reported that the R N D wounded were always the best looked after of all the wounded passing through this station The A D M S issued a special medical memo embodying all these very satisfactory reports

Owing to the diminution in numbers in our division it now became necessary to reduce to two brigades, viz, the 1st under Brigadier-General Mercer consisting of the *Drake Hawke Nelson* and *Hood* battalions, with Surgeon Bradbury as the S M O and the 2nd, under Brigadier General Trotman, consisting of the *Portsmouth Howe Chatham* and *Anson* battalions with Surgeon Schlesinger as S M O

During August the overhaul of the medical stores continued, the three different types of stores being disposed of as follows —

Unissued regular Army pattern stores went to the advanced medical depot a receipt being obtained for them from Major McDonald R A M C the O C of this depot The special first aid haversacks and medical officers haversacks with their refill boxes went to our three field ambulances The regular Navy pattern medical stores (field chests valises, &c), brought out as a temporary substitute for regular Army pattern stores awaited permission to be sent to R N Hospital, Malta Fate, however upset all this carefully arranged plan Enemy shells destroyed a large quantity of these stores so laboriously sorted and stacked

The medical unit lost two splendid officers in August Playne, of the Portsmouth battalion had to be invalided home with a corneal ulcer and McCracken of the *Hood*, with a bullet wound in the iliac region

On August 17 we took over part of the line held by the 29th Division, on one of their brigades proceeding to Suvla The medical dispositions in consequence consisted of manning the Pink Farm dressing station enlarging it and making it more bullet proof

The A D M S made a thorough inspection of all our new trenches and R A P s and decided on definite routes for the evacuation of the wounded Surgeon Calthrop with his usual energy and initiative, cleared with his own men the traverses from one of the cross trenches, thus greatly facilitating the work of the stretcher bearers

A plan of our new trenches is here shown and gives an indication of the routes for evacuating the wounded

On August 20 Surgeon Fry and seventy-five other ranks arrived as re-

[illegible] Army Corp[s] ... [illegible] ... sector September [illegible]

[illegible] the A D M S [illegible] it p[illegible] About this [illegible] [illegible] the large number of sand flies f[illegible]nd [illegible] those of Sedd ul Bahr Towards the end [illegible] with the A D M S the serious increase in [illegible]y demanded that no more cases should [illegible] be just as necessary that officers and men wh[illegible] as fighting machines was nil should not [illegible]

In D[illegible] appeared the announcement that Surgeon [illegible] the D S O

On A[illegible] Paris presented the D S M to Sergeant Roberts [illegible] and in congratulating him took the opportunity [illegible] medical unit on their splendid zeal and devotion [illegible]

In th[illegible] fighting confined itself to sporadic artillery [illegible] Casualties from wounds became less [illegible] sickness steadily and with alarming rapidity [illegible] the A D M S of the French second division [illegible] troops as quite good but they certainly appear[illegible] than our men whose health could be by no means [illegible] example on September 8 out of a working party [illegible] fifty fainted

[illegible] sanitation and bacteriology paid short visits to the [illegible] including Colonel Dudgeon Colonel B[illegible] with the A D M S in the urgency of tackling the [illegible]

[illegible] had been found in the stools [illegible] that the differential examination of [illegible] in the field Consequently we gave [illegible] supposed we cured many and [illegible]

On S[illegible] the Scottish international foot[illegible] He had received a scratch on his arm and [illegible] all these small wounds such as abrasions of the hands [illegible] Surgeon [illegible] reported he had as many [illegible] treated twice daily with boric fomentations for septic wounds [illegible] He found the boric salicylic powder very useful in th[illegible] not surprising that sepsis occurred, when one considers the [illegible] condition of the camps and trenches. Limb[illegible] from the parapets of some of the captured Turkish trenches. Improvements in sanitation still proceeded but always under great difficulties.

On September [illegible] Surgeon Atkinson arrived having been sent out especially to deal with the fly nuisance. Improved sanitation and cooler [illegible] Atkinson served as a special sanitary officer and with his characteristic energy at once entered upon his duties. He helped to superintend water purification, scavenging, disinfection, &c. He obtained permission to use the electric power installed by the French in Sedd-ul-Bahr fort. With this he produced a weak hypochlorous acid disinfectant by electrolysing sea water, this disinfectant being freely used in latrines, &c., near the coast, to try to save our other disinfectants for use inland. However, it proved a failure. At this time the War Office sent out Captain Campbell, R.A.M.C., with a small bacteriological laboratory, and we suggested that something might be learnt as to the part played by swallowed sand in the initial causation of the prevailing diarrhoeas if the ash of a given weight of desiccated stools of these diarrhoea cases could be compared with that of normal stools of healthy people in England.

On September 19 we had our first rain for six months and the weather became more autumnal. We consequently started making plans of camps, drying sheds, &c., preparatory to a winter campaign, the medical and the engineer officers exchanging views on the various details.

On September 21 a wind storm from the north-east started and lasted for two or three days. This cold wind seemed to be one of the causes of a marked increase in the cases of jaundice. Reinforcements arrived for the medical unit on September 19 and 21. The A.D.M.S. told off some of these reinforcements as nursing orderlies in the battalions, an arrangement quite contrary to correct Army establishment, but necessary in view of the large amount of sickness amongst the men still carrying on.

Stanford's 2nd Field Ambulance started returning from Suvla in parties of about forty on September 26, and, as already mentioned, he himself arrived with the last party on September 30.

The Pink Farm dressing station had now been completed by Calthrop and his men.

An exclusively medical telephone system had been in use with our previous medical stations and had been largely responsible for the great efficiency shown by our medical unit. Unfortunately, owing to the shortage of instruments, a similar arrangement as follows could not be installed.

In Oct[illegible] the artillery [illegible] interm[illegible]. The weather [illegible] became colder and more stormy. [illegible] squalls [illegible] the covers off [illegible] and the drenching [illegible] everything. Apparently as a [illegible] of the cold and wet [illegible] increased, and the A D M S [illegible] that [illegible] should be [illegible] for the use of officers [illegible]

On October [illegible] the 87th Brigade of the [illegible]th Division returned from S[illegible], and on October 11 two battalions of the City of London Royal [illegible] arrived from England. We also received back our [illegible] battalion from S[illegible]. All of these troops came under us for medical administration, and we instructed their medical officers as to our routine and the [illegible] of [illegible] medical stations.

On O[illegible] we received a supply of a special disinfectant called disinfectant "C," and with it some spraying apparatus was supplied. We had to report on its efficacy in dealing with decomposing human and animal corpses. The A D M S and Atkinson carried out extensive experiments and sent in reports which may be summarized as follows: —

This disinfectant fluid "C" is staining and greasy in nature and highly inflammable. It is very effective as a deodorant and fly deterrent. If liberally sprayed (one to two gallons per corpse) on otherwise inaccessible corpses it is sufficiently preservative to allow them to shrivel up and mummify without foul-smelling decomposition. To reach corpses in no man's land the spraying apparatus should be a very powerful one, capable of throwing the fluid twenty or thirty yards. For a dead mule about four gallons would be necessary. It is not a very effective larvicide. As a rough and ready rule manure heaps and latrines would have to be sprayed daily, corpses every three or four days, and dug-outs, &c., every week.

On October 17 Sir Victor Horsley visited us and distributed amongst our medical officers a booklet on the latest experience of "Treatment of Injuries in War." On this day also General Munro relieved General Sir Ian Hamilton in command of the Mediterranean Expeditionary Force.

On October 21 the G O C held a conference of Commanding Officers, some of the subjects under discussion being anticholera inoculation and methods for dealing with lice.

On October 23 it became evident that the A D M S had typhoid fever and accordingly had to be sent to Egypt in the hospital ship *Salta*. An interesting point about this is that a blood culture made on arrival in hospital proved the disease to be pure typhoid fever, and that it attacked the patient almost exactly one year after he had been inoculated.

In Divisional Orders, dated November 3, 1915, appeared the following appointments: —

"Fleet Surgeon E J Finch, R N, is appointed A D M S Royal Naval Division vice Fleet Surgeon A Gaskell, R N (invalided), dated October 26, 1915.

Surgeon A T Rivers, R N, is appointed Acting O C 3rd Field Ambulance vice Fleet Surgeon E J Finch, R N.

From October 25, 1915, until the evacuation on January 10, 1916, Fleet Surgeon Finch became the A D M S of the Royal Naval Division in Gallipoli. As soon as he took over the duties he spent the first week in a thorough tour of inspection of all the trenches, camps, field ambulances and wells of the R N D.

His medical unit continued to shrink in numbers. Eykyn, Parry-Price, Ballance and Williamson had to be sent away sick and their places filled from the field ambulances; consequently the three field ambulances had only sixteen medical officers instead of twenty-seven. On November 12 the 3rd Field Ambulance removed the whole of their remaining personnel and stores to the winter encampment which we had started about the end of September on the face of the cliffs of "X" beach. Here, relieved from all other duties, they completed the building of their quarters. They quarried stone themselves, and they used wood from a wrecked lighter they had found on the beach. To prevent land slides they drove in piles. It shows what versatility our men possessed that they constructed a very excellent station in spite of receiving no help from the engineers, who proclaimed it a foregone conclusion that any building on this loose cliff face must be a failure.

The 2nd Field Ambulance also completed their winter quarters, this work being comparatively simple, as an excellent dressing station had been constructed already in the olive grove by the engineers.

On November 17 the new A D M S issued the following medical order:—

Divisional Headquarters,
Royal Naval Division,
17th November, 1915.

Fleet Surgeon Finch wishes to call the attention of all medical officers to and to emphasize the previous instructions of Fleet Surgeon Gaskell regarding:—

(1) Vague Diagnoses.

No man should be entered in the Sick Book or sent to hospital for complaints described as "pains in the head" or "injury to lower extremity." More details should be supplied: the probable cause of the pains in the head should be stated, the injury should be noted as "sprain," "contusion," "gunshot wounds," &c., and the part affected clearly stated. If a wound appears to be self-inflicted it should be clearly noted. If an injury of any kind is due to shot or shell injury it should be noted, not merely diagnosed as "compound fracture of femur," &c., and if an injury not sustained in action it should be noted whether it occurred when the man was or was not on duty. Thus, "sprain of left knee (duty)" tells all that is required; the same thing described as "injury of lower extremity" can only in the future be guessed at. So with a case described as "compound fracture of arm." This may have been a matter affecting one or more of several bones, may have been sustained in or out of action [illegible] duty or [illegible] duty. In [illegible] case [illegible] compound fracture of left [illegible] (gunshot) or comp[illegible] fracture right ulna (fall from horse), [illegible] s the kind of thing [illegible] required.

[illegible] Tallies.

S[illegible] and wounded sent from battalions to field ambulances or from [illegible] to hospitals should be provided with the ordinary service [illegible]. If [illegible] happen from time to time the supply of tallies runs [illegible] possible to manufacture substitutes from fairly thick paper [illegible] that all the headings printed on the tally are written and filled [illegible] substitute. Long lists of men should not be sent on one piece [illegible] of these [illegible] are retained in the field ambulances and [illegible] hospitals on arrival at hospital some are retained there [illegible] hospital ship, &c. It is obvious that the work [illegible] field ambulances and hospitals is considerably [illegible] not being provided in the first place with a [illegible] sufficient substitute for it.

[illegible] The necessity of keeping an accurate record of all persons presenting [illegible] treatment. Only cases actually placed upon the sick list [illegible] entered in the M 195 Book, but all cases of injury sustained on [illegible] should be entered in the sick list even if the injury is so slight that [illegible] shown as discharged to duty on the same day. A record of [illegible] attending list only should be kept in the attending list book. [illegible] ages, ranks, units, numbers, dates of admission to sick or attending list, dates of disposal and manner of disposal (duty, hospital, &c.), with particulars of the injury or sickness as laid down in paragraph 1, should be carefully noted and the books carefully preserved. This applies [illegible] every medical officer, and in the case of medical officers of the field ambulances a record of all men of the R.N. Division who are treated in the field ambulance, or who have passed through it on their way to hospital, should be kept. The O.C. each F.A. should preserve in his [illegible] and discharge book a record of men of units other than the [illegible] Division who are treated at or passed through his field ambulance [illegible] way to hospital.

(4) The necessity of keeping a constant watch over all sources of water supply (especially those used for drinking purposes), latrines, urinals, cook houses, incinerators, refuse pits and horse lines. Unless this is done the [illegible] will generally misuse the wells, empty refuse which ought to be burnt in the incinerator into the refuse pit, permit uncovered faeces to [illegible] with flies, and so on. The whole camp should also be very frequently inspected from a sanitary point of view, and fragments of food, empty tins, paper or other poisonous rubbish should not be allowed to lie about. Dug outs should be inspected at intervals to see that the men keep them in a clean state inside, that ventilation is not deficient, and to ascertain that they are not avoidably damp. Men whose clothes get wet should be given all possible facilities for changing them and for getting the wet

[illegible] — Washing water should not [illegible] cleaning [illegible] [illegible] . . . Water of the [illegible] is that [illegible] should [illegible] purposes. Night [illegible] should be provided in [illegible]. In chlorinating water it appears to be [illegible] desirable [illegible] somewhat and [illegible] the amount of bleaching powder used down to the exact minimum required as indicated by the water test box. The Sanitary Diary Book should be carefully kept up; those seen up to the present contain many valuable suggestions for Commanding Officers.

(5) The necessity of keeping a careful watch for the presence of lice: close hair clipping and cleanliness of person, with the free use of the disinfector for clothing and blankets should make these pests rare. While in camp battalions have a great opportunity for cleaning up, and all possible advantage should be taken of it. Bedding and clothing should be freely aired when the weather permits; even during the winter months in the Mediterranean there are many days on which it is possible and pleasant to bathe, and men should be encouraged to do so.

(6) The necessity of impressing upon every officer and man the desirability of being fully inoculated against typhoid fever and cholera. Medical officers should endeavour to arrange with C.O.'s to give short lectures to the men in camp during the winter evenings on sanitary subjects, and during these lectures the importance of inoculation cannot be too frequently touched upon. A list of non-inoculated or partially inoculated men in each unit should be made up and kept, and these men should not be allowed to slip out of memory.

(Signed) L. J. Finch,
Fleet Surgeon R.N. and A.D.M.S. of R.N. Division.

On November 15 Surgeon Sparrow and two days later Surgeon Rayner went sick with gastro-intestinal symptoms, not sufficiently serious, however, to necessitate their leaving the Peninsula.

On November 22 Surgeons Cunningham, McEwan and Gow with twenty ratings arrived as reinforcements for the medical unit. The three field ambulances by now had become so reduced in numbers that the A.D.M.S. decided to abolish the original second and to call the original third the new second or "X" beach ambulance, the change to take place on December 1, Stanford taking command of this "X" beach ambulance and Rivers losing his command. Part of this new "X" beach ambulance manned the old main dressing station in the olive grove. The A.D.M.S. issued a long order giving every detail of this reduction of the three field ambulances to two.

Heavy rain occurred on November 21, followed by four days of snow and sleet, causing much trouble by freezing the water carts and pumps. Beri-beri now made its appearance—a case occurring in the *Chatham* battalion.

Surgeons Rivers, Bradbury and Parker and Quartermaster Scammell [illegible] working officers went sick and their places had to be [illegible] tary redistribution The first three returned to duty later [illegible] the evacuation

[illegible] 30 the deep-well sinkers having at last obtained their [illegible] and bored to a depth of 110 feet with 30 feet of water

[illegible] of the first week in December it became evident that the [illegible] troops could not stand the cold weather

[illegible] 10 therefore these troops left the Peninsula—their part [illegible] taken over by the Royal Naval Division At the same [illegible] nal Headquarters moved to French Hill for winter quarters The [illegible] arrangements made necessary by this move are shown in the following [illegible] randum —

Divisional Headquarters,
Royal Naval Division,
9th December 1915

[illegible] —

[illegible] 1st and 2nd Field Ambulances
Royal Naval Division

In [illegible] nection with the taking over of a new sector and the abandoning of the [illegible] previously occupied by the R N D the following medical arrangements have been made —

The 1st and 2nd F A s will each supply sufficient men and material to undertake the treatment and evacuation of sick and wounded from the regimental aid posts, the 1st working on a line leading from the trenches lately occupied by the French, and the 2nd working on another line from the trenches lately occupied by the 52nd Division

With regard to the work of the 1st F A, the regimental aid post is situated at *B I Avenue de Paris* Empty stretchers and men passing up to this will proceed by the *Avenue de Constantinople*, full stretchers and men [illegible] down will proceed by the *Avenue de Paris* On the way down [illegible] bearer posts situated at *1 Station Bouchet 2 Station d'Amade* situated on a cross trench between the *Avenue de Paris* and *Avenue de Constantinople* (continuation of Eski Line)

Ambulance wagons will be parked at Hill 200 for the present and will proceed from there as far as is permissible towards the *Station d'Amade* in order to lighten the work of the stretcher-bearers These wagons being loaded up will then proceed to the dressing station of the 1st Field Ambulance at Fleming Nullah

With regard to the work of the 2nd F A the regimental aid posts are situated at —

(1) The junction of Central Street and Trotman Road

(2) The junction of Plymouth Avenue and Wigan Road

Bearer posts will be established at Brown House and Plymouth Avenue in rear of Redoubt Line Sick and wounded from the right of the sector will pass by way of Brown House to the advanced dressing station in Achi

Lahi Nallah [illegible] will pass through bearer posts [illegible] dressing station in Achi Baba Nullah [illegible] thus will be conveyed [illegible] wagons [illegible] as permissible from Hill 60 where they will be parked [illegible] wagons of the 2nd F A will then proceed to their main dressing station [illegible] the valley, 400 yds in rear of New Bridge West Krithia Road

By arrangement with the A D M S of the 52nd Division although [illegible] division will be relieved on December 10 the bearer posts and advanced dressing stations will remain manned by the 52nd Division F A until the morning of the 11th and the advanced dressing station of the R N D at Pink Farm and bearer posts beyond will remain manned by R N D F A until the same time

At 1000, on December 11 a sufficient party from the 52nd F A will be at Pink Farm where a guide is to be supplied them from the 1st F A R N D, and they will proceed to take over Pink Farm and the advanced bearer posts until then manned by the R N D At the same hour on the same day a sufficient party of the 2nd F A R N D will be at the advanced dressing station (Old Fast Lancs dressing station Achi Baba Nullah) where a guide will be supplied by the 52nd Division, and they will then proceed to take over the advanced dressing station and bearer posts until then manned by the 52nd Division The 2nd F A R N D, will also send a few men to take over the dressing station at Hill 200

Any cases of the 52nd Division evacuated by the R N D F A during December 10 and following night will be discharged to the No 11 A 52nd Division, and any cases evacuated during the same period from the R N D by the 52nd F A will be sent to the main dressing station 2nd F A R N D By this means each division will show its own men in its return

The O C 1st F A will arrange to take over not later than 0530 on the morning of the 11th the advanced dressing station (*Station d'Imade*) and the bearer posts at *Station Bouchet*

On arrival field ambulances are immediately to get into touch with regimental aid posts Until telephonic communication is properly established much will have to be done in sending for ambulances &c by means of orderlies

E J Finch
Fleet Surgeon R N and A D M S of R N Division

On taking over this French area our medical unit soon discovered that more sanitary work would fall to their lot

In the month of December the weather improved considerably, except for a heavy fall of rain on the 21st which for a time reduced the trenches to a water logged condition

On December 11 Surgeon Schnier, receiving a shell wound, was relieved by Surgeon Gow General Paris had a severe attack of bronchitis on

December 1a and on the following day Surgeon Walker went on the sick list The rains and cold weather left a legacy in the form of many cases of jaundice and trench feet

On December 23 our medical unit received orders to hand over the splendid camp which they had so laboriously built on the cliffs at "X" Beach It seemed the fate of the unit to make camps for others to occupy

McDonnell the medical officer of the 3/4 Londons, went sick with trench nephritis on December 28, and his place was taken by Surgeon Crow

Towards the end of December the plucky and untiring Calthrop had almost arrived at the end of his tether He refused to acknowledge this, however, and stuck to his work, but had to be sent to hospital on January 3 His organizing ability and energy were much missed during the strenuous period of preparation for the evacuation This evacuation became common knowledge at the end of December, and thenceforward frequent conferences took place and plans prepared As far as the medical unit is concerned, the following brief diary sums up the principal events —

December 30 —All unnecessary papers destroyed

December 31 —Papers and baggage sent to D A D O S for evacuation Surplus field ambulance stores sent away that night with a party of 600 men, not physically fit of whom seven were from the medical unit Surgeon Cox went in medical charge of this party

January 1 —The most valuable of the medical stores gradually sent to D A D O S every night for evacuation Eighty-nine men from the 2nd Field Ambulance with Surgeons Key Monat and Sewell embarked at "V" beach that night

The R N D took over the last portion of the French line and handed over to the 52nd Division the Achi Baba Nullah route and dressing station as well as Regent Street and Oxford Street (vide attached memo)

January 2 —All officers and men of the field ambulances, except 10 officers and 220 men required for the last days leave "W" Beach at 10 p m (This amounted to 3 officers and 25 men from 2nd and 2 officers and 25 men from 1st Field Ambulance) All rum and other alcoholic liquors were destroyed

January 3 —The A D M S had frequent interviews with the D A A G resulting in much worrying administrative work The A D M S examined the route proposed for evacuation and found it impossible for vehicles Consequently the G O C permitted the ordinary route for the few ambulance vehicles passing from Orchard Valley to Sedd ul Bahr

January 4 —Surgeon Schlesinger relieved Surgeon Calthrop who as already stated, had to be sent to hospital The day and hour of final evacuation were fixed for January 10 between 12 15 a m and 1 15 a m the strength of the R N D medical unit retained till this final evacuation being sixty under the command of Surgeon Rivers [illegible] quarters [illegible] and [illegible] drew up [illegible] unit [illegible] *vide* attached [illegible]

[illegible]

[illegible]								
B 1		[illegible]				1		
B 8		[illegible]				[illegible]		—
Ragnon		[illegible]			1	[illegible]		
Source [illegible]		[illegible]				1		—
Bearon [illegible]								
Point D [illegible]	1	[illegible]	—	—	—	[illegible]	1	1
D [illegible]		[illegible]				1		
Boyan C[illegible]		[illegible]				[illegible]		
Head of [illegible] meot) [illegible]		[illegible]	—	—	—	[illegible]	1	1
Harrods [illegible]		[illegible]		10		1		
V Beach [illegible]		[illegible]		—	—		1	—
Point 1								[illegible]
2								
2a								
1								1
8					—			
1								
11								1
11a								
[illegible]								
[illegible]								
1								
3a								
9								
8a								
1			—					
On the [illegible]		[illegible]		1				
D H Q		[illegible]	[illegible]					1
[illegible]				[illegible]		[illegible]		[illegible]
[illegible]	11	[illegible]	11	1	[illegible]			

[illegible]

No more p[illegible] [illegible] All cases from trenche[illegible]

[illegible]

ambulances being responsible for any transport necessary. The ambulance wagons performed regular trips from Zimmerman Farm and the head of Vermeche Nullah.

January 6.—Surgeon Rivers relieves Surgeon Taylor on "V" Beach and establishes a dressing station marked by a red lamp. He is to remain here until the very last party, viz., the demolition party, leave the Peninsula. All evacuation is to take place from "V" and "W" beaches. The original idea of using Gulley beach and "X" beach is now cancelled.

The seven surplus drivers and three medical unit men under Sergt. Edwards proceeded to "V" beach with mules and the horse used by Fleet Surgeon Finch. They embarked on the following night. Two of our men were injured by shell concussion.

January 7.—Heavy shelling by the Turks in the afternoon and Taubes flew over. More "final" instructions being issued, Surgeon Schlesinger proceeds to his advanced post with his men.

January 8.—Orders again amended, as D.H.Q. cancelled schedule A and replaced it by schedule D.

January 9.—At 5 p.m. the remaining transport of the 2nd Field Ambulance embarked. Thence onwards at intervals of two hours large parties moved quietly down from the camps and trenches to the beaches and embarked.

As these parties passed the various rendezvous they were checked by officers. As regards the medical unit this checking was done by Fleet Surgeon Finch, Captain Cassment and Surgeon Rivers. Only three cases had to proceed to the beach by ambulance, viz., two sprained ankles and one bullet wound of leg.

January 10.—12.45 a.m. to 1.45 a.m. The third and last party from the trenches passed the checking station. After this the remaining medical unit men were counted and found correct, and sent down under Staff Sergeant Wilson to the beach with the last ambulance wagon and the remaining medical stores.

The A.D.M.S. and D.A.D.M.S. then walked to the forming-up station at Sedd ul Bahr and embarked with Staff Sergeant Wilson's party at No. 4 pier. After this the demolition party started on their work. During the afternoon the remaining horses and mules were shot and stores including the last ambulance wagon were destroyed.

Finally, towards evening in calm weather Surgeon Rivers and his men embarked with the demolition party. The destroyers encountered a freshening wind and some sea as they proceeded via Imbros to Mudros.

The last of the medical unit arrived at Mudros in the evening of January 10. The A.D.M.S. mustered the unit and found it correct. Surgeon Rivers was one of the first to land in Gallipoli and one of the last to leave. His work throughout this strenuous campaign more than fully justified his selection as one of the few regular officers chosen for the Royal Naval Division.

This history cannot [illegible] without a tribute being paid to those two splendid officers Finch and Casement.

Finch though by no means of robust health, possessed that wonderful pluck to carry on through everything He served his superior officers with loyalty and he endeared himself to all his subordinates Unostentatiously he went about his work and was ever untiring in his devotion to the sick and wounded.

Casement was lent to the Royal Naval Division by the War Office, and no better choice could have been made Magnificently healthy, a fine international footballer he exemplified the *mens sana in corpore sano* His was the exact type of mind for the purpose Never perturbed always full of common sense and ready to adapt himself to any kind of strange situation he was of immense value to the Division Every officer and man not only admired but loved this quiet fearless and clever doctor

This ends the history of the medical unit of the Royal Naval Division from its inception to the evacuation of Gallipoli It will be seen that this medical unit fully deserved the remarks made by General Paris in his preface to the book written by Surgeons Sparrow and Ross entitled On Four Fronts with the Royal Naval Division These remarks have been already quoted and are worth repeating They are as follows 'I am glad to have this opportunity to express my high appreciation of the loyal assistance given by all ranks of the Division frequently under most difficult circumstances The medical arrangements especially during the Gallipoli Campaign, when everything had to be improvised, were the admiration of all Jerrold in the 'History of the Royal Naval Division speaks of General Paris as having "never erred on the side of over enthusiastic praises So much more valuable, therefore is the above mentioned eulogy

Postscript—An alphabetical record of every officer and man of the medical unit, giving his name date of joining whence joined particulars of service final disposal with date and whither disposed would make a book of great interest to everyone of us who served in the unit but would hardly come within the scope of the present history

Such a book might be prepared by anyone who could have access to all the returns of the medical unit These returns are I believe stored at the Royal Marine Depot at Deal But for the sake of future computations as to casualties to be provided for a daily list of the sick killed wounded and missing is useful Such a list has been impossible to make completely (i e including medical personnel of battalions &c), as no opportunity has occurred to scrutinize the above mentioned records at Deal

From the records of the three field ambulances while employed with the R N D during the period of April 25 1915, to December 31, 1915 the following interesting figures emerge —

Daily average strength	—	515
Total sick		449
Total killed		9
Total wounded	—	82
Total missing		*Nil*

Clinical and Practical Notes.

A CASE OF SNAKE BITE.

By [illegible] Commander [illegible] AUSTIN, M.B. [illegible]

[illegible] aged 20 was bitten by a snake on February 21, 1921, while at [illegible] He was walking with another [illegible] along a path beside [illegible] the camp. Both [illegible] wearing shoes and [illegible] saw a snake on the path about to strike at him. He [illegible] to the man behind [illegible] did not hear the warning [illegible] promptly bit him on the [illegible] side of the right ankle. [illegible] its escaping, but from the description given [illegible] the [illegible] group—a species of viper.

[illegible] with great presence of mind at once removed [illegible] the bite vigorously and applied a tourniquet. He [illegible] the wound by rubbing in [illegible] and [illegible] camp [illegible] about 10 [illegible] and they [illegible] the patient [illegible] great difficulty [illegible] the last [illegible]

[illegible] in the camp the patient was somewhat collapsed [illegible] He was suffering from uncontrollable vomiting. He complained [illegible] in the abdomen. There was no discoloration of the [illegible] general congestion due to the tourniquet.

[illegible] and put to bed. The wound was [illegible] After this strong doses of stimulant were [illegible]

[illegible] Vomiting still continuing, watery fluid being vomited [illegible] of vomiting.

[illegible] freely open. Passed [illegible] urine.

[illegible] Temperature [illegible] He complained of painful [illegible] He also stated that he could only just see the end of his [illegible] open his eyes, the left upper eyelid seemed to droop [illegible]

[illegible] the night, waking occasionally for a few moments [illegible] found it difficult to swallow or speak.

[illegible] 99.2° F., pulse 90. Bowels open four times [illegible] dark brown in colour [illegible] of blood. Breathing [illegible] with swallowing and speech. Disinclined to take [illegible] Both upper eyelids fully drooped. No paresis of [illegible] the [illegible] surrounding the bite discoloured and puffy. Stimulants [illegible]

[illegible] p.m.: Temperature 100° F. Pulse 108. Feeling better.

[illegible] Temperature 98.6° F. Pulse 106. He was very restless during the [illegible] of the night. Slept well after midnight. Complained of pain in the [illegible]

[illegible] Temperature 99° F. Pulse 84. Constipated. General condition [illegible] Speech and swallowing better. Condition of eyelids the [illegible]

[illegible] Temperature [illegible] F. Pulse 76. Slept well all night.

[illegible] Temperature normal. Pulse 66. Still constipated. Appetite [illegible] swallow solid food. Given ol. ricini 1 oz.

A SPORADIC CASE OF MEASLES WHICH OCCURRED ON BOARD H.M.S. *ENDEAVOUR* WHILST ON SURVEYING DUTIES IN THE RED SEA

By Surgeon Lieutenant-Commander R. E. SHAW, M.C., M.B., R.N.

J. W. C., stoker, aged 23, reported at the sick bay on March 1, 1926, complaining of bleeding from the nose and a rash which was noticeable on the face, neck, shoulders and arms, also a slight pain in the back. Temperature 100·2° F., pulse 96.

On questioning the patient I found that he had first felt slightly ill on the previous Wednesday, February 24, slight headache, sneezing, coughing and running from the eyes and nose on the Friday and Saturday. He noticed the rash on Sunday evening, but did not report until the following day as he thought it was sweat rash.

Examination showed running from the eyes (which were suffused) and nose; the conjunctivae were also injected, and he had a slight cough; the throat was clean but very congested, as also was the buccal mucosa; no definite Koplik's spots could be made out owing to the sordes in the mouth and marked congestion.

The eruption consisted of papules raised above the skin and disappearing on pressure.

The following day the rash was more prominent and had invaded the trunk and thighs, while the legs and feet, including the soles of same, showed a similar raised rash, but paler in type. Temperature 100·8° F., pulse 80. Patient looked ill; face was puffed and bloated; he had a slight cough, tongue furred and buccal mucosa extremely red.

He had been vaccinated twelve months previously, PVV3, and had never had measles to his knowledge.

By March 3 the rash was nearly confluent over parts of the whole body, the back and buttocks presenting an almost uniform redness.

On seeing the case I decided it was one of measles, and the patient was isolated on the boat deck, a tent being rigged for him and the usual precautions against risk of infection were taken.

As the ship came into harbour on March 2, I asked Dr. Ghobse, D.P.H., D.T.M., to see him, and he agreed that the man was suffering from measles.

All the engine room ratings, stokers and seedie boys were inspected daily for fourteen days, and a medical inspection of the ship's company was carried out on March 8.

The case ran a normal course and there were no complications. No fresh cases occurred.

The above facts are of interest in that:—

(1) The man was infectious when he reported sick.

(2) No fresh cases occurred, but most of the ship's company were sleeping on the upper deck, thus minimizing the risk of infection.

(3) Patient had not been ashore since November 30, 1925, when the ship was at Malta.

(4) No cases of measles were known to have occurred at Kameran or Aden, our only other two ports of call.

I am at a loss for explanation as to how this man became infected, unless he came into contact with some infected clothing which may have harboured the measles germ.

[illegible]OVASUROL IN CHRONIC NEPHRITIS

By Surgeon Captain F. T. NICHOLLS, R.N.

I[illegible] of the *British Medical Journal* of January 30 and Fe[illegible] 1936, [illegible] references to the use of novasurol in cardiac œdema su[illegible]ed a trial of the same drug in two cases of œdema from chronic nephritis.

J. R. Stoker P.O. (pensioner) aged 58 admitted December 26 19[illegible] with albuminuria cyanosis, severe dyspnœa and all other signs of [illegible] with a failing heart. Marked ascites œdema of ankles, legs and scrotum.

He was treated on the usual lines paracentesis of the abdomen and acupuncture of the legs performed. He improved up to February 16 [illegible] when œdema of the legs and ankles began to increase and the abdomen [illegible] with fluid the output of urine falling.

He was then given novasurol 0.5 c.c. (intramuscular) increased to [illegible] third day. The output of urine gradually rose till on March 4 he [illegible] 112 oz. in twenty-four hours. With this there was a general [illegible] condition, œdema subsided entirely, and there was little [illegible]. The patient was up and walking about the ward.

Unfortunately the case could not be followed up [illegible] discharged at [illegible] own request March 5.

D. M. Mate Y.C. aged 40, admitted June 4 19[illegible] with enormous [illegible] of feet extending up the legs thighs and loins [illegible] from the scrotum the hands and eyelids were also involved. Very marked [illegible] cyanosis. Urine contained 0.6 per cent albumin and cells and [illegible]. Pulse could not be counted. B.P. systolic 210 diastolic 120. [illegible]

Patient stated illness had commenced four weeks previously but [illegible] seen a doctor. No history of previous illness. He appeared to [illegible] and was placed on accepted lines of treatment.

June 5 passed 13 oz. urine, condition critical. 0.7 c.c. [illegible] (intramuscular).

June 6 passed 12 oz. urine little change in condition.

June 7 passed 18 oz. urine 1 c.c. novasurol given.

June 8 passed 110 oz. urine.

June 9 passed 126 oz. urine. Marked improvement [illegible] dyspnœa all œdema had cleared except slight of ankles and feet.

June 10 passed 96 oz. urine no œdema of limbs [illegible] B.P. systolic 190, diastolic 100.

June 12 passed 141 oz. urine albumin fell to 0.1 per cent.

From this time on condition of patient rapidly improved [illegible] until June 28 when B.P. had fallen to systolic 138 diastolic 90 albumin 0.05 per cent lungs clear.

Patient a few days after passed out of my care but from [illegible] he was continuing to progress.

Novasurol does not appear to act for forty-eight hours and it is advisable to commence with small doses to avoid untoward symptoms such as [illegible] and vomiting, which appeared in another case treated with a full dose at the commencement.

[illegible] BLOOD [illegible]

[illegible] P. T. [illegible]

[illegible] admitted Mar. [illegible] of [illegible] some weeks [illegible]

[illegible] all [illegible] otherwise nothing relevant.

[illegible] limbs, large white face, large [illegible] not very marked. [illegible] haemorrhages, disc edges swelled [illegible]

[illegible] a few pus cells, red blood [illegible]

[illegible] per cent.

[illegible] as on admission for [illegible] 0·280 grm. per cent. [illegible] headache and vomiting. Little [illegible]

[illegible] minutes only, treated [illegible]

[illegible] per cent.

[illegible] as long as he did; (2) th[illegible] the first was one [illegible] increasing blood urea he did not [illegible]

[illegible] M. Morris for [illegible]

Surgical Notes

[illegible] WARREN, O.B.E., M.B. [illegible]

[illegible] in Surgery. A. Piney. *British Journal* [illegible]

[illegible] leucocytes in the blood are derived from myelocytes [illegible] lobed nuclei are more mature than those with single [illegible] intermediate stage in which the nucleus is [illegible] but [illegible]

[illegible] maturity of a polymorphonuclear leucocyte may be [illegible] the nucleus, but this is by no means certain and [illegible]

[illegible] the following groups: (1) cells with completely [illegible] cells with slight nuclear indentation (young forms); [illegible] lobulation, but with the nucleus as a long narrow [illegible] typical polymorphonuclears. In normal blood [illegible] neutrophile granulations and band nuclei [illegible]

[illegible] correspond accurately with [illegible] process.

(a) Slight [illegible] with little change [illegible] and persistent [illegible] of good significance [illegible] pathological [illegible].

(b) Slight [illegible] leucocytosis with [illegible] degree (e.g. [illegible] per cent. of young [illegible] types) decrease [illegible] eosinophils and slight increase [illegible] indicate the presence of infection. Further examination [illegible] before a prognosis could be given.

(c) A high [illegible] cytosis with great [illegible] decrease or [illegible] of eosinophils [illegible] tive of a grave [illegible] especially if the young [illegible] the band type.

(d) Recovery [illegible] occur where there [illegible] fall [illegible] number of [illegible] increase of [illegible] total [illegible] eosinophils at [illegible].

(e) Progressive [illegible] with rising tendency to [illegible] significance.

(f) When [illegible] eosinophils [illegible] decrease with [illegible] the index to normal [illegible].

The author emphasises the fact that the degree [illegible] feature on which the most stress is to be laid, but [illegible].

CLIMATIC B[illegible] H. M. Hanschell [illegible]

Climatic [illegible] though common [illegible] It is an [illegible] associated with [illegible] which is usually [illegible] which has [illegible] serious [illegible] arthritis [illegible] successfully [illegible] put to bed and the [illegible] such cleansing [illegible] cut away under [illegible] with [illegible]. No [illegible] fluctuation [illegible] apply [illegible].

These [illegible] typhoid and paratyphoid [illegible] on. A hundred [illegible] an hour or twenty [illegible] is already p[illegible] perature falls [illegible] subsides [illegible] longer than four [illegible] days more [illegible].

Notes on Tropical Medicine

By Surgeon Rear Admiral Sir P. W. Bassett-Smith
K.C.B., C.M.G., F.R.C.P., F.R.C.S.

Bronchial Spirochætosis

It was Castellani who described this condition as a specific entity, and he has been followed by many others who have reported cases from very widely different geographical areas.

The disease shows various clinical characters: acute with hæmorrhage, [illegible] subacute bronchitis with hæmorrhagic conditions attended with gangrene of the lung with quantities of spirochætes, &c. In these latter, according [illegible] Kline, the spirochætes are associated with fusiform bacilli probably aspirated from the mouth. It may arise as a complication of any pulmonary condition and is not usually recognized from the primary disease. Kline and Berger state that it is a serious complication which is frequently fatal if left untreated. The sputum is brown and fœtid. They describe sixteen cases, five who were not properly treated died. Fortunately arsphenamine is almost specific if given early, but many other arsenical preparations act equally well—such as neo-salvarsan and sodium cacodylate.

The following method is described by Besançon and Lisbegoin as being a satisfactory way of detecting the organism. Shake a small quantity of the sputum in [illegible] c.c. of saline solution and allow it to stand for half an hour in an incubator at [illegible] C. The spirochætes accumulate on the surface of the liquid from which a small loop is taken for dark-ground examination or for film making. The spirochæta is 7 to 15 microns long, with 3 microns between the turns, but its difference from that of Vincent's angina is doubtful. Friedlander states that the [illegible] are very polymorphic and he has not consider them to cause a specific [illegible]. Delamore, who also has not been able to differentiate them from those of Vincent, agrees with him.

[illegible] the name of *Spirochæta ...*, Micholoni (U. A.) describes what [illegible] new disease in Montevideo. It commences as a gonorrhœa [illegible] condition of meningitis in which the eyes, ears and heart are [illegible]. Diagnosis is made by the discovery of the spirochæta, not by the [illegible] but by the patient himself, who is told to fix his gaze on the sky after [illegible] and the demonstration by drawings of what he should see, [illegible] detects the spirochætes swimming in the anterior chamber of [illegible].

[illegible] diagnosis by suggestion and is described in the [illegible] May, 1925, but it is difficult to imagine any editor [illegible] and as a curiosity is interesting.

Preparations, &c.

THE "AGLA" MICROMETER SYRINGE APPARATUS

The accurate instrument for the measurement of extremely minute quantities of liquids described by Dr. J. W. Trevan in *The Biochemical Journal*, vol. xix, No. 6, p. 1111, is now obtainable from Burroughs Wellcome and Co. It is known as the "Agla" Micrometer Syringe Apparatus, and is suitable for the measurement of volumes from 0.5 c.c. (with an error of less than ± 0.1 per cent) to those as small as 0.001 c.c. (with an error of less than 5 per cent). In immunological work the instrument can measure volumes of the order of 0.01 c.c. with an error of less than ± 1 per cent. Price in London 55s. complete, net. Further details may be obtained from Burroughs Wellcome and Co.

Reviews.

Surgical Operations. By William Ibbotson, M.R.C.S., [illegible], F.R.C.S. Ed., Consulting Surgeon in Ear, Nose and Throat Diseases, [illegible] Surgeon to the Ear, Nose and Throat Department, [illegible] Wales General Hospital, Tottenham, N., &c. Second [illegible]. London: Faber and Gwyer, Ltd. Pp. xxxv + 356. Price [illegible].

The title of this book is misleading: it would be more accurately described as "A Catalogue of Surgical Operations."

Part I deals with the preparation of the operating theatre, dressings, ligatures, sutures and the sterilization of instruments. The section on ligatures and sutures is comprehensive. Part II is a classified list of instruments and appliances required for each operation and occupies 268 pages. Part III gives illustrations of instruments and appliances alphabetically arranged.

It is stated that the object of this book is to provide a ready and practical aid to all engaged in surgical work, but especially for nurses. We are unable to understand what class of nurse the book is intended to assist. If the fully trained theatre sister, why describe a modern operating theatre? If the probationer, why confuse her with the names of eleven operations for the relief of varicose veins? It is hardly likely that the surgeon will tersely instruct the sister or the sister the probationer to lay out the instruments for [illegible] operation. It seems to us that the book would be of much more use to the operating surgeon, especially such well arranged sections as amputations, operations on cranial nerves, &c.

The book shows evidence of a very careful compilation and the expenditure of an enormous amount of work. In any future edition we would suggest the less frequent use of capital letters (e.g., "Pair of Peri Renal Clamp Forceps" and "Hollow artificial Globe of Glass or Gold"), which are very trying to the eye, and the omission of such useless illustrations as those of a glass rod and a piece of catgut.

G. O. M. D.

The Treatment of the Acute Abdomen, Operative and Post-Operative. By Zachary Cope, B.A., M.D., M.S., F.R.C.S. Pp. 247. [illegible] illustrations. London: Oxford University Press. 1926. Price 10s. 6d. net.

Mr. Cope has brought out this book as a companion volume to his equally valuable work "The Early Diagnosis of the Acute Abdomen." The scope of the present work is that of the earlier one and the two should be studied together.

For such wide subjects both books are relatively small, so one knows they must be either a compendium of all information grievously condensed or a limited selection of the knowledge of the subject rather dogmatically put, and it is the latter idea which Mr. Cope has put into practice. To make such a selection which will prove satisfactory the writer must be a surgeon of wide experience, great knowledge and undoubted authority, and Mr. Cope admirably fills these requirements. From his experience a selection has been made of the line of treatment which can be most readily carried out by the general practitioner or the inexperienced surgeon faced by such an abdominal emergency as has been indicated by the previous work. Within those limitations this book is a remarkably successful and helpful one, and any criticism directed against it indicates the preferences of the reviewer rather than any lack of sound surgical teaching.

The earlier chapters are devoted to instruments, dressings and [illegible] operative technique. Then shortly and clearly the necessary operative treatment of appendicitis, perforated gastric ulcer, acute pancreatitis, obstruction

subjects [illegible], applying plaster jackets, medico-legal notes and the preservation of pathological specimens. The chapter on fractures presents the subject from a particularly practical point of view. No subject of real importance appears to have been omitted and there is no obvious redundancy.

In friendly criticism the following points appear to require amendment. When the surgeon is recommended to "stand" while performing artificial respiration it should be mentioned that this refers only to cases where the patient is on the operating table; the paraffin dressing for burns is called "ambrine," not "ambrine"; the use of an undine might be mentioned for washing out the conjunctival sac, as it produces a much more gentle stream than cotton wool; there is a painful split infinitive on page 320 line 27 and fig. 98 does not correspond with the text.

The book rightly deserves the popularity it has attained.

G. O. M. D.

Hints to Probationer Nurses in Mental Hospitals. By Richard Eager, O.B.E., M.D.Aberd. London: H. K. Lewis and Co., Ltd. Second Edition 1926. Pp. 88. Price 1s. 6d. net.

The aim of this little book is to assist those who, entering upon their duties in mental hospitals, have not had previous experience of such work. The first edition was reviewed in this Journal (Vol. IX, p. 154) and in the course of the perusal of this the second edition, it occurs to us to make one or two further suggestions. For instance, in the section on ward duties, having in mind the importance of impressing upon beginners in particular the little details that go to make the whole, we would like to see added to the list of requisites detailed in the paragraph on tube feeding a small jug of cold water in connection with the need that sometimes arises for stimulating the pharyngeal reflex during the passage of a tube. In the paragraph on the preparation of catheters, we think it would be more in accord with modern teaching if sterilized glycerine be advocated, or some more reputable lubricant in place of carbolic oil, which has long been discredited for this purpose. In dealing with the prevention of bedsores, we read that rubbing and other attention to the parts are recommended to be carried out at least night and morning. We do not consider this puts the case impressively enough to the probationer, especially when dealing with paralysed patients, for all on the secret of successful prevention lies in performing the prescribed toilet on every occasion that the patient has been found to be faulty.

The author's teaching, as might be expected at the hands of one so experienced in the training of mental nurses, is sound and the language very readable and as near to coming within the comprehension of those for whom it is intended as it is possible to write it.

The author is to be congratulated on the very happy and lucid similes he uses in the section on Psychology in dealing with the various psychological processes such as consciousness, imagination, memory, &c. In this connection a few remarks on orientation might well be included in future editions.

A minor correction is called for on p. 45 where on line 7 "makes" should read "make," and on p. 59 the term mamie depressive appears, possibly as a misprint for manic depressive.

Used, as the author advocates, in conjunction with the "Handbook for Mental Nurses," this little work should prove a helpful *vade mecum* to probationers and a useful adjuvant to the medical officer upon whom devolves the responsibility for their instruction.

C. K. B.

[illegible] of Medical Electricity and Radiology. By James R. Riddell, [illegible] Lecturer on Electrical Diagnosis and Therapeutics, University [illegible] Glasgow; Radiologist, Western Infirmary, Glasgow, &c. Edinburgh: [illegible] S. Livingstone. Crown 8vo, 230 pp., 110 illustrations. Price [illegible] net.

The book is written for the student. It is quite elementary in character, but [illegible] in a clear and concise form an indication of the methods of x ray examination and diagnosis, and summarizes the numerous conditions which are amenable [illegible] at the hands of the radiologist and electro-therapeutist, and briefly [illegible] the different agents which may be employed by him in the several conditions and the methods of their application.

There are nine chapters. Chapter I deals with electro-therapeutics, gives a brief account of the various forms of electricity in use, and indicates the nature of their action. Chapter II deals with the examination of the electrical reactions of nerves and muscles, and includes a table showing the action of the more important muscles with remarks on their examination, and is followed by a series of diagrams showing the motor points. Chapter III deals with the production and control of the Röntgen ray. The description of a coil outfit given is of the briefest. Chapter IV gives a short account of the action of x rays on living tissue. Chapter V indicates the use of x rays in diagnosis, giving a short description of x ray equipment, localization of foreign bodies, the methods of regional examinations, with a summary of the diagnostic points of the commoner pathological conditions; reference being made to pyelography, cholecystography, and the use of lipiodol in the diagnosis of lung conditions. This chapter is illustrated by numerous skiagrams. Chapter VI indicates the uses of x rays in treatment, and includes a brief description of the Erlangen technique. Chapter VII deals with the use of radium; Chapter VIII with the employment of light in the treatment of disease, with reference to the principal kinds of lamps in use; and Chapter IX gives a short description of the uses of carbon dioxide snow.

The preface states that the purpose of the book is to present to the student "as concisely as possible a brief survey of those physical agents which are employed in the practice of medicine and are usually found grouped together in the electrical department of a general hospital, to inform him in what cases they are of service, how much is to be expected of them, and the mode of their application." This purpose it fulfils admirably.

W. H. H.

A Descriptive Atlas of Visceral Radiograms. By A. P. Bertwistle, M.B., Ch.B., F.R.C.S.Ed., and [illegible] H. W. Shenton, M.R.C.S., L.R.C.P. With 330 illustrations. London: Henry Kimpton, 263 High Holborn, W.C. 1926.

This is a collection of radiograms illustrating the normal and various pathological conditions of the alimentary, urinary, respiratory, nervous, vascular, dental, thyroid, osseal, female generative and miscellaneous systems. The illustrations are contributed by various experienced observers and are very well reproduced. Each plate is accompanied by a short descriptive note which summarizes the clinical history and operative findings, and is further elucidated by a small diagram facilitating its interpretation.

The illustrations of the alimentary system comprise a good series of normal and typical pathological conditions, many excellent radiograms being contributed by Dr Spriggs and Mr Marxer, and by Dr Rowden. Mr Morriston Davies and Dr Johnston have supplied the majority of the lung conditions illustrated; Professor Fullerton, Dr Rowden and Mr Kidd the renal plates.

The plates include examples of lipiodol injection of the spinal theca in cases of tumour, &c., contributed by Professor Sicard, the introducer of the method, but no examples are given of the use of this opaque solution for the demonstration [illegible] a well [illegible] [illegible] tions. [illegible]

[illegible] to [illegible] guinea [illegible]

[illegible] Harvard [illegible]

[illegible] the [illegible]

[illegible] standard of the [illegible] available it will [illegible] and sanitation, [illegible]

J. L. P.

Radi[illegible] Bela[illegible] By [illegible] Heineman [illegible] M.D. Lo[illegible] Oxford University Press [illegible]

As [illegible] is made in [illegible], there comes a time [illegible] should be set [illegible] the speciality in [illegible] radiotherapy and [illegible] the Navy for a [illegible] the therapeutic [illegible] and at times perhaps [illegible] experience [illegible] rays can be [illegible] that it can yet [illegible] of the skin of the [illegible] has [illegible] of [illegible] many years [illegible]

Dr. [illegible] Johnson [illegible] effects of x rays on the body. He [illegible] rather than [illegible] healthy tissues surrounding [illegible] effects of the rays [illegible] the parallel [illegible]

In the early chapters of this book [illegible] to the latest theories on many physical questions in a way [illegible] the mind [illegible] "When [illegible] more than eighty ultimate [illegible] the elements the physical chemistry of to-day recognizes only [illegible] electricity. It should be [illegible] that the distinction [illegible] matter and energy has also gone by the board."

Then there is an interesting chapter [illegible] theory in relation to [illegible] and the causation of [illegible]

When [illegible] a long list, the conditions which can be benefited by radiation, the [illegible] story to excuse of the apparent discrepancy that one [illegible] promotion of fibrous tissue in cancer of the breast while one also [illegible] get rid of fibrous tissue in keloid. There is he says a Greek fable about a traveller who sought shelter from a storm in a satyr's cave. His hands were cold and the satyr observing that he blew upon his fingers asked him why he did so. "To warm my hands" the traveller replied. His host then hospitably busied himself in heating a bowl of milk, which as soon as it was ready he handed to his guest. The milk however was too hot to drink and the traveller blew on it as he had done on his fingers. "Why do you blow again?" said the mystified satyr. "To cool the milk" replied the other. Whereupon crying out that he could be no honest man, the satyr in a fury fell upon the traveller and slew him.

This little book cannot fail to be of interest and it is hoped that no one will be deterred from reading it by the somewhat specialist title. It is written to appeal to the general practitioner rather than the specialist.

W H E

ORTHOPAEDIC SURGERY. By W. A. Cochrane, M.B., Ch.B., F.R.C.S.E., Assistant Surgeon, Royal Infirmary, Edinburgh, late Clinical Assistant, Orthopaedic Department, Massachusetts General Hospital, Boston, U.S.A. Edinburgh: E. and S. Livingstone, 1926. Pp. 335 with 301 illustrations. Price 21s net.

Slowly but surely the medical profession as a whole is beginning to realise the vast importance and the immediate possibilities of the science of preventive medicine. Relatively we have heard little of preventive surgery on which sound orthopaedic practice must rest. Clinical surgery, like clinical medicine, is based on a keen appreciation and an accurate knowledge of morbid anatomy, which in turn is founded upon the origin and progress of a particular pathological lesion. The book under review follows these lines, tracing the course of certain bodily functions from their true physiology through perverted physiology till they pass into the sphere of disease.

As the author freely acknowledges in the preface he has been fortunate in gathering experience under Goldthwait and Osgood in the city of Boston, U.S.A. The teaching of Lovett and Whitman in America and of Sir Harold Stiles and Sir Robert Jones in this country have clearly left an abiding impression on the author's mind which is passed on to the reader through the medium of this book.

The volume is divided into two main sections of which the first is the more original. At the same time it is recognized that the second part is largely based on the conclusions arrived at in the first. Part I is devoted to a consideration of the mechanics of posture in the normal human type. Following on this two extreme types are described in detail, viz. the slender or general visceroptotic type and the heavy herbivorous type. Between these lie the intermediate [illegible] which tend to produce certain diseases which fall into the province of the orthopaedic surgeon. Owing to faulty postural habits or ignorance of sound bodily mechanics we learn that the human frame becomes so [illegible] that [illegible] physiological function is rendered impossible and consequently breaks down. In the course of reasoned argument we are driven to the conclusion that an elevated chest and an erect carriage of the head and upper part of the body are very closely concerned with the support and function of the abdominal viscera. Reference is made to Sherrington's work on muscle tone in order to draw attention to the need for muscular relaxation as in standing, when the [illegible] continued strain is thrown on the ligamentous structures. Here we [illegible] how the centre of gravity of the body passes in front, behind or through the axes of various joints. A knowledge of such facts is of paramount importance if, for instance, fractures are to be treated with any degree of success. As the [illegible] very [illegible] exercises." The body [illegible] should be considered, and not merely the foot [illegible] back, chest, or abdomen [illegible] presents the lesion. The physiological effects [illegible] discussed fairly in relation to preventive medicine, and well chosen exercises [illegible] forth, each with a definite purpose in view.

Part II [illegible] divided regionally into chapters on the foot and ankle, knee, hip, spine, shoulder, and so forth. Torticollis, acute anterior poliomyelitis and spastic paralysis receive their measure of attention. In some instances we prefer the description of the lesion to the treatment awarded, but this does not detract from the merits of the book as a whole. We congratulate the author on the manner in which he has presented his subject to the reader. To medical officers who have specialized in the study of physical training this volume will prove invaluable, while the physician and surgeon will look on many problems from a different aspect if they will practise the precepts which it lays down.

The book itself is well and strongly bound, while the text is singularly free from printer's errors.

H E R S

MODERN METHODS OF AMPUTATION. By Thomas G. Orr, A.B., M.D., F.A.C.S., Professor of Surgery, University of Kansas. London: Henry Kimpton. 1926. Pp. 117. Illustrations 125. Price 16s. net.

In this work only those amputation methods are presented which are practical and workable, and which afford good functional results. The author rightly places great emphasis on function, and which can be assured only by careful operative technique and choice of method. The first two chapters deal with general considerations and amputation stumps, and subsequently amputations of the upper and lower extremities are described. A brief account is given also of cinematoplastic amputations and artificial limb fitting.

The general technique of amputations receives full consideration, and the advice given is sound. Several muscles should be grouped about the bone end and fixed to the periosteum and fascia, redundant muscle tissue being useless. Fascia flaps are of advantage in many instances, furnishing a good tissue for muscle insertion if sutured over the end of the stump. Periosteum should be removed from the end of the divided bone for a distance of ½ to 1 cm., and a small quantity of medulla should be curetted out. Nerves should be drawn down and divided as high as possible, each nerve of sufficient size being injected, just proximal to the point of section, with 95 per cent. alcohol.

The illustrations throughout are numerous and good. The book can be recommended strongly to the general surgeon, and also to the practitioner who may be called upon occasionally to amputate a limb.

W L M

THE DOCTOR'S BOOKS. By A. P. Bertwistle, M.B., Ch.B., F.R.C.S.Ed. London: John Bale, Sons and Danielsson, Ltd. Price 1s. 6d. net.

This small book describes a simple, practical method of book keeping for medical practitioners. The author claims that it is easy to run and to understand; that no special books or cards are required, and that it also includes a case book. The method is clearly described and illustrated and appears to fulfil the claims made for it.

Retired naval medical officers about to commence private practice are advised to study this little book.

News of the Service.

OBITUARY

[illegible] report the death of Fleet Surgeon John Black Nicoll, M.D., R.N. [illegible] burgh on July 11, 1926.

[illegible] 185[illegible], he qualified L.R.C.S. Ed. in 1860 and entered the Royal N[illegible]. He was promoted Staff Surgeon in 1871, Fleet Surgeon in 18[illegible] [illegible] July, 188[illegible].

We [illegible] the death of Surgeon Captain John Charles Graves [illegible] at the age of 68.

He [illegible] L.R.C.P. Lond. [illegible] Hospital [illegible] Surgeon [illegible] promoted to Staff Surgeon [illegible] 1901, Fleet Surgeon [illegible] with the rank [illegible] age regulations in 191[illegible] [illegible] the Boxer [illegible] China [illegible] H.M.S. [illegible] [illegible] Blue[illegible]

On the [illegible] went to the Torpedo Depot Ship at Sh[illegible] [illegible] retired.

To [illegible] sympathy.

DEGREES AND DIPLOMAS

Surgeon [illegible] J. A. Maxwell, M.B., B.A., was successful [illegible] examination for the Fellowship of the Royal College of Surgeons (Edinburgh).

EXAMINATION FOR PROMOTION

The following Medical Officers, in alphabetical order, were successful [illegible] for promotion to Surgeon Commander at the end of the [illegible] months [illegible] commenced on February 15, 1926:

Surgeon Lieutenant Commander J. F. Anlo[illegible]
J. B. H[illegible], M.B.
[illegible] Hunt, M.B.
H. Hurd[illegible]
S. R. Johnston.
O. J. R. Kerrigan.
R. W. Nisbitt, M.B., M.R.C.P.
J. [illegible] Wylie, M.B.

PROMOTIONS

Surgeon Captain W. L. Martin, O.B.E., F.R.C.S.I., promoted [illegible] dated Aug. [illegible] 1926.

The following Surgeon Commanders have been promoted to Surgeon Captain [illegible] 1926: Thomas B. S[illegible], M.B.; [illegible] L. Crosbie, F.R.C.S.I.; [illegible] [illegible] M.B., B.A., F.R.C.S.Ed.

Surgeon Commander (D) [illegible] Fletcher, O.B.E., promoted to Surgeon [illegible] dated July [illegible] 192[illegible].

Surgeon Lieutenant Commander R. J. [illegible], M.B., promoted to Surgeon [illegible] dated July 15, 192[illegible].

Surgeon Lieutenant Commander M. B. Macl[illegible]od, M.B., promoted [illegible] dated July 24, 1926.

Surgeon Lieutenant Commanders R. A. W. Ford, [illegible] M.B., [illegible] M.B.; and W. [illegible] Conrad, M.D., [illegible] M.R.C.P., [illegible] Commander dated Aug. 14, 1926.

Surgeon Lieutenant Commander R. [illegible]iddle, O.B.E., M.B., and W. [illegible] promoted Surgeon Commander dated August 5, 1926.

AWARD OF SIR GILBERT BLANE'S GOLD MEDAL

[illegible] of the Gilbert Blane Medal for the year 1926 has been made to Surgeon Lieutenant [illegible] R. Johnston, who obtained the highest aggregate marks at the examination [illegible] with the promotion courses 1925–26 and 1927.

APPOINTMENTS

June

[illegible] C. A. Griffiths, D.S.O., to *Egeria*. [illegible] Commander [illegible] S. Mill [illegible] M.B., to *Yarmouth*. [illegible] Burns to *Impregnable*. [illegible] B. Bradley, M.B., to *Repulse*. [illegible] Surgeon Lieutenant for Short Service.

July

[illegible] J. S. Dudding, D.S.O., to R.N. Hospital Chatham. [illegible] McCutcheon, M.D. [illegible] Hospital Haslar. [illegible] Hughes to *Fearless*. [illegible] Woodruff Massall to Portland [illegible] Royal Marine Infirmary Deal. A. T. Rivers to Medical Department [illegible] D.S.O., M.B., F.R.C.S., to *Egmont*. [illegible] W. I. Hingston, C.B., to [illegible] M.O. [illegible] A. R. Schofield, M.B., to *Benbow* [illegible] Haslar Hospital (and as Medical Specialist). A. I. Sheldon to [illegible] Carlisle to *Champion*. [illegible] C. Wright [illegible]

[illegible] A. I. Shaw, M.B., to R.N. Hospital Chatham (and to [illegible] R.M. Infirmary [illegible] A. W. Neill [illegible] entered as Surgeon Lieutenant for Short Service. Surgeon Lieutenants [illegible] D.S.C., to [illegible] M. Nixon to [illegible] entered as [illegible] A. L. Stewart, M.B., entered as Surgeon Lieutenant for [illegible] M. Hughes to *Emperor of India*. L. F. Brown to [illegible]

August

[illegible] R.N. Hospital Malta. [illegible] M.B., to [illegible] (and as Squadron M.O.). [illegible] A. McGlay, M.B. [illegible] M.B., B.A., to [illegible] (and as Squadron [illegible] M. Hearn [illegible] W. C. Thwaytes [illegible] W. W. [illegible] to [illegible] H. Wallis [illegible] Johnson. J. F. [illegible] Sloan, M.B., entered as Surgeon [illegible]

September

[illegible] O.B.E., to *Tiger*. [illegible] *Royal Oak* [illegible] A. C. Valpy French to [illegible] Vickery to [illegible] F. Cook [illegible] M.D. Schlesinger Surgeon Commander (D) [illegible] to R.N. Hospital [illegible] L. R.

[illegible] H. Gow [illegible] Surgeon Lieutenant [illegible] R.N. [illegible] Chatham.

RETIREMENTS

[illegible] Rear-Admiral A. Maclean, C.B., D.S.O., M.B., placed [illegible]

Surgeon Rear-Admiral C. M. Pendred, C.B., placed on retired list [illegible]

Surgeon Commander F. F. Alderson, D.P.H., placed on [illegible] 20, 1926, with rank of Surgeon Captain.

Surgeon Commander A. C. Renwick, M.B., placed [illegible]

Surgeon Commander [illegible] Blunt, placed on retired list [illegible] rank of Surgeon Captain.

[illegible] Commander M. [illegible] Mason, placed on retired list [illegible]

Surgeon Commander M. [illegible] Laffan, M.B., placed on retired list [illegible] with rank of Surgeon Captain.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

The undermentioned ladies were entered as Nursing Sisters to be on probation for six [illegible] on the dates stated:—

Miss Cecilia A. Rhodes, July 9, 1926.
" Dorothy Lampard, August 30, 1926.
" Muriel [illegible], August 30, 1926.
" Phyllis G. Carolin, September 1, 1926.
" Gertrude M. Meadows, September 1, 1926.
" Henrietta K. Laurent, September 11, 1926.

PROMOTIONS

Superintending Sister Miss C. C. Renwick, R.R.C., promoted to Head Sister [illegible]

Nursing Sisters Miss A. [illegible] Hartley-Jones, Miss M. Basden Smith, A.R.R.C., and Miss [illegible] Bunbury, promoted to Superintending Sister, dated July [illegible]

APPOINTMENTS

Head Sister Miss C. C. Renwick, R.R.C., to Malta Hospital.

Superintending Sister Miss A. F. Hartley-Jones to [illegible] Queensferry Hospital [illegible] Superintending Sister Miss [illegible] Gregg, R.R.C., to Hong Kong Hospital. Superintending Sister [illegible] F. M. Keay to R.N. Sick Quarters, Shotley.

Nursing Sisters Miss A. M. Taylor to R.N. Sick Quarters, Dartmouth [illegible] Hospital [illegible] M. de [illegible] to Haslar Hospital; M. Gardner [illegible] Portland Hospital [illegible] Chatham to Malta Hospital; C. H. Rhodes to Plymouth Hospital [illegible] Hospital [illegible] M. [illegible] to [illegible] Hospital; [illegible] G. Carolin [illegible] Haslar Hospital; [illegible] M. [illegible] to Chatham Hospital; and H. K. Laurent to Chatham Hospital.

RESIGNATION

Nursing Sister Miss M. Basden Smith, A.R.R.C., resigned her appointment [illegible] 1926. (Promotion to Superintending Sister cancelled.)

NAVAL MEDICAL COMPASSIONATE FUND

At the Quarterly Meeting of the Directors of this Fund held on July 6 [illegible] considered, and [illegible] to the applicants. The following is a summary [illegible] related:—

[illegible] of a Deputy Inspector-General in the [illegible] Navy, who died in 190[illegible] [illegible] Voted £[illegible]. Total amount granted to the dependents of this deceased Officer [illegible]

Widow of a Surgeon Commander [illegible] two young children [illegible] Voted £25. Total amount granted [illegible] £110.

ROYAL NAVAL HOSPITAL, MALTA

[illegible] who have served at the Royal Naval Hospital, Malta, will [illegible] Memorial Tablet has been placed in the Chapel there [illegible] Staff Officers and Ratings at the Hospital [illegible] a large gathering of [illegible] the tablet was unveiled by the [illegible] the Chaplain on August 30, 1926, the first anniversary of [illegible]

NORTH PERSIAN FORCES MEMORIAL MEDAL

[illegible] O.B.E., M.D., [illegible] has been awarded the North Persian Forces Memorial Medal for the year 1925 for his paper [illegible] Malaria in the [illegible] Mesopotamia during 1924, published in the *Journal of the Royal Naval Medical Service*, 1925, vol. xi, No. [illegible], pp. [illegible]

[illegible] award of the Medal which, in accordance with the terms of the Trust [illegible] is awarded annually for the best paper on Tropical Medicine or Hygiene [illegible] during the preceding twelve months [illegible] of the Royal Navy, Royal Army Medical Corps, Royal Air Force, [illegible] the Colonial Medical Service, provided the Memorial Committee [illegible] a paper of sufficient standard [illegible] being in award.

ADMIRALTY ORDERS

[illegible] Medical Officers R.N., Dental Officers R.N., and Queen Alexandra's Royal Naval Nursing Service—Improved Conditions of Service.

(C.W. [illegible] 1926.)

[illegible] of the recommendations of the Inter-Departmental Committee on the Medical [illegible] Fighting Services the following changes in the conditions of service [illegible] R.N., Dental Officers R.N., and Members of Queen Alexandra's Royal Naval [illegible] been approved. These changes will take effect from July 1, 1926, or as soon [illegible] necessary arrangements can be made.

I.—MEDICAL OFFICERS, R.N.

[illegible] *Establishment of Surgeon Captains.*—The maximum number of Surgeon [illegible] will be increased from sixteen to twenty. The Surgeon Captains [illegible] R.N. Hospital Haslar as Professors of Medicine and Surgery respectively [illegible] will the general [illegible] described below. The appointment of [illegible] Naval Medical School, R.N. College, Greenwich, will in future be [illegible] Surgeon Captain will be appointed to the R.N. Hospital, Malta. [illegible]

[illegible] *Allowances and Number of Appointments.*—The number of [illegible] will be increased from forty-six to sixty, and the new appointments will [illegible] Radiology and Hygiene. The allowance payable to [illegible] appointments will be increased from 2s. 6d. to 5s. per day as from [illegible]

[illegible] The grant of charge pay will be [illegible] from July 1, 1926, on the [illegible] charge of hospitals and sick quarters:—

[illegible] and Surgeon Captains 10s. a day
[illegible] 5s. a day

[illegible] *Courses.*—Every Officer below the rank of Surgeon [illegible] an appointment at a Home Hospital or is due to take [illegible] can be spared once in every four years [illegible] of not less than four months' duration [illegible] At the end of the course, instead of being [illegible] will be appointed to duty at one of the R.N. Hospitals [illegible] receives an appointment elsewhere.

[illegible] selected to hold a Specialist appointment will, provided [illegible] not less than six months' duration [illegible] special [illegible] and will subsequently undergo a [illegible] subject every four years while he is employed as a [illegible]

[illegible]—The existing Senior Medical Officers' Courses will be [illegible]

[illegible]

[illegible]			200
[illegible]			150
			105

[illegible]

[illegible] Syringes, Hypodermic, Serum Record, &c.—Care of
([illegible] 6183/26.—16.7.1926[?])

[illegible] the necessity of dissembling all syringes made of metal and [illegible] [illegible] this procedure is a frequent source of breakage [illegible] expansion of glass and metal.

2153.—Specialist Medical Officers—REPORT.
(C.W. [illegible])

[illegible] number of specialist appointments for Medical Officers, R.N. [illegible] [illegible] appointments. [illegible]

[illegible] Medical Officers [illegible]

[illegible] subjects:—

[illegible] Health Officers)

[illegible] Nose and Throat

[illegible]

* The [illegible] Allowance [illegible]

[illegible] for Short Service [illegible] the Appendix [illegible] Medical Officer [illegible] Navy [illegible]

[illegible]

Remarks of Med[illegible] Med[illegible]

Signature [illegible]

[illegible]

2669.—Weight of Men—Record
(N. 9725 [illegible])

[illegible] Regulations and Admiralty Instructions [illegible] that the weight of [illegible] should be entered [illegible] Medical [illegible]

2. The [illegible] Art. 1206 Clause [illegible] weights are to be entered on [illegible] Regulations and Admiralty [illegible]

[illegible] Art. 1206(5).)

2670.—Drunkenness—Medical Examination of Persons suspected of
([illegible])

[illegible] alleged [illegible] to perform his duty [illegible] the Commanding Officer [illegible] Medical Officer [illegible] wholly or in part by [illegible] actually [illegible]

[illegible]

[illegible]

(1) [illegible]

(2) [illegible] to perform his duty

(3) [illegible] alcohol.

[illegible]

POST-GRADUATE HOSTEL

[illegible] Hotel, Russell Square, London, W.C.1

[illegible] Hostel was formally opened on July [illegible] 1926 [illegible] McAdam [illegible]. The following officers were elected:— [illegible] Tours, K.B.E., F.R.C.S. [illegible] Thomas Horder, Bt., K.C.V.O., F.R.C.P. [illegible] Alfred Cox, O.B.E. (representing the British Medical Association); [illegible] (representing the Royal Society of Medicine); Dr. [illegible] C.I.E.; Lady Barrett [illegible] Esq., F.R.C.S.E.

[illegible] Alfred Cox took the Chair and Mr. McAdam Eccles read a paper prepared [illegible] the Hostel and its Objects.

[illegible] the Hostel are to provide a central hall of residence for medical men coming [illegible] and discussions on medical subjects, to further the work of the [illegible] and other post-graduate [illegible] and to foster [illegible]

[illegible] Hostel is prepared to accommodate residents and [illegible] the dining room for those [illegible] bedroom, bath and breakfast 10s. 6d. a day [illegible] hotels.

[illegible] Hostel [illegible] to fully qualified medical practitioners [illegible] Hotel [illegible]

[illegible] No introduction beyond the presentation of [illegible] place.

[illegible] addressed as follows:—

[illegible] Imperial Hotel, Russell Square, W.C.1.

[illegible]—A. P. Baldwell, Esq., F.R.C.S., [illegible] Square, [illegible]

THE ROYAL INSTITUTE OF PUBLIC HEALTH

[illegible] "Problems of Personal and Public Health" will be delivered [illegible] the [illegible] the Institute, 37 Russell Square, London, W.C.1.

[illegible] October 20, 4 p.m. "The Prevention and Treatment of [illegible] Conditions [illegible] Occupational Origin" (with lantern illustrations). By W. J. O'Donovan, O.B.E., [illegible] Assistant Dermatology and Syphilology Department, London Hospital.

[illegible] October 27, 4 p.m. "Town Planning in Relation to Health" (with lantern [illegible]). By Professor L. P. Abercrombie, M.A., A.R.I.B.A., Professor of Civic Design, [illegible] Liverpool.

[illegible] November 3, 4 p.m. "Ventilation in Relation to Health" (with lantern [illegible]). By H. M. Vernon, M.A., M.D., [illegible] Investigator for the National [illegible] Board.

Wednesday, November 10, 4 p.m. "Industrial Psychology applied to the Home." [illegible] Professor [illegible] C.B., O.B.E. [illegible] Lord [illegible], Professor of Physiology, London School of [illegible] Medicine.

Wednesday, November 17, 4 p.m. "The Problem of the [illegible] Children." By [illegible] Miller, M.D., F.R.C.P., Physician, Paddington Green Children's Hospital.

[illegible] League

[illegible] for Tuberculous [illegible]

[illegible] Parliam[illegible]

[illegible]

[illegible]

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Notices

The [illegible] Medical Officers to send [illegible] Original Papers on professional [illegible] personal experiences. Also Items of news and matters of [illegible] the Naval Medical Service will be welcomed from ships and [illegible] on home and foreign stations.

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